

SUBJECT INDEX

A

A-kinase anchoring protein (AKAP)

regulation of PKA by, 236-37

A-kinase anchoring protein (AKAP) mediated signal transduction, 235-57

coordination of multivalent signaling complexes by

A-kinase anchoring protein (AKAP), 238

cyclic AMP-dependent protein kinase, 236

evolution of A-kinase anchoring proteins (AKAPs), 237-38

muscle A-kinase anchoring proteins (mAKAPs), 238-48

regulation of PKA by A-kinase anchoring protein (AKAP), 236-37

A1298C polymorphism, 190

Abbott Laboratories, 388

Absorption

of tea catechins, 29-30

(2-Acetoxyphenyl) heptynulfide (APHS),

63

Acids

See Arachidonic acid; Bile acids; Cellular retinoic acid binding protein;

Chenodeoxycholic acid;

Fatty acids; Lithocholic acid;

Retinoic acid receptors;

Taurochenodeoxycholic acid; Valproic acid

Activating PXR

xenobiotics for, 6-7

Activation of MAP kinase cascades by integrins direct, 289-91

Active site signature motif, 210

ADAPT II software, 120

Adenine nucleotide translocator (ANT), 266

Adenomatous polyposis coli (APC), 61, 299

Adenosine triphosphate (ATP), 325-28

structural studies of, 327-28

Adhesion receptor families, 284-88

and associated cytoskeletal components, 285

cadherins, 286

Ig CAMs superfamily, 287

integrins, 284-86

selectins, 287-88

Adverse Drug Reaction

Terminology, 122

Aequorea Victoria, 411

Affinity labeling, 438-39

Agronomic benefits

from genetically modified foods, 100

AIF

See Apoptic-inducing factor

Airway hyperresponsiveness (AHR), 82, 84-87

AKAP 350/450/CG-NAP coordinated signaling complexes, 246-47

YOTIAO, 244-46

AKAP220, 242-43

RII binding enhancing PPI

inhibition by, 245

signaling complexes, 244

Alb-PXR

See Wild-type human PXR

Allergenicity assessment, 109-10

Allergens

sequence homology to known, 104-5

Allergy & Immunology Institute, 102

Altered DNA methylation, 501-25

carcinogenesis as a multistage, multistep process, 502-3

cell proliferation and carcinogenesis, 512-14

DNA methylation and carcinogenesis, 505-9

importance of epigenetic mechanisms, 503-5

and imprinting, 510-12

interrelationships between mutagenesis, genome stability, 509-10

as a secondary mechanism underlying

carcinogenesis, 515-18

significance of secondary mechanism concept, 501-2

Altered DNA methylation as a secondary mechanism underlying

carcinogenesis, 515-18

heritable, aberrant patterns of methylation, 517

normal patterns of methylation, 517

Aminergic G protein

- aminergic GPCR structure and molecular modeling, 450–54
 binding site of, 437–67
 general indexing method for residue numbering, 438
 methods to identify binding site residues, 438–50
 second extracellular loop, 454–57
- Aminergic GPCR structure** and molecular modeling, 450–54
 binding site, 451–52
 receptor activation, 454
 structural bases of pharmacological specificity, 452–54
- Amines** biogenic, 2
- Amycolatopsis orientalis*, 381
- Amyl nitrate**, 585
- Angiogenesis** inhibition of invasiveness and, 45
- Animal models**, 107–8
- Animal studies**, 170–71
- ANT** See Adenine nucleotide translocator
- Anti-IL-1**, 87
- Anti-IL-4**, 85–86
- Anti-IL-5**, 82–85
- Anti-IL-9**, 87
- Anti-IL-13**, 86–87
- Anti-inflammatory cytokines**, 88–90
 IL-10, 88–89
 IL-12, 89–90
 IL-18, 89–90
 interferons, 89
- Anti-TNF**, 87
- Anticancer activities** mechanisms of, 42–46
 studies in cell lines, 42–45
- Antifungal drugs**, 4
- Antihyperalgesic vs. analgesic actions of NSAIDs**, 554
- Antioxidative properties of tea polyphenols**, 28–29
- AP-1 and related activities** inhibition of, 43
- APC** See *Adenomatous polyposis coli*
- APHS** See (2-Acetoxyphenyl heptynlysulfide (APHS))
- Aplysia californica*, 143
- Apoptotic-inducing factor (AIF)**, 266
- Apoptosis** inhibition of, 43–44
- Arabidopsis thaliana*, 528
- Arachidonic acid** conversion to PGH2, 57
- Aspergillus*, 328
- Aspirin**, 63
- Assessment of allergenicity** of foods produced through agricultural biotechnology, 101–9
- animal models, 107–8
- FAO/WHO decision tree approach to, 103
- level of expression of the novel protein, 109
- resistance to pepsin, 107
- sequence homology to known allergens, 104–5
- source of the novel gene, 102–4
- specific serum screening, 105–6
- targeted serum screening, 106–7
- Asthma therapies**, 81–98
 anti-inflammatory cytokines, 88–90
 chemokine inhibitors, 82, 90–92
 inhibition of
- proinflammatory cytokines**, 87
- inhibition of T helper 2 (Th2) cytokines, 82–87
- other approaches to cytokine inhibition, 92–93
- strategies for inhibiting cytokines, 81–83
- ATP** See Adenosine triphosphate
- Autographa californica*, 263
- B**
- Backphosphorylation**, 242
- Bacterial ligases** production of D-ala-D-X dipeptides by, 389
- Bactericidal effect of vancomycin on Gram-positive bacteria**, 384
- Baculoviral IAP repeat (BIR) domains**, 261–62
- Basic fibroblast growth factor (BFGF)**, 198
- Bcl-2 family members**, 265–68
- Bcl-2 homology (BH) domains**, 264
- BEL** See Bromoenol lactone
- Benz[a]pyrene (BP)**, 33
- Betamethasone**, 3
- BFGF** See Basic fibroblast growth factor
- BH** See Bcl-2 homology domains
- Bidentate inhibitors**, 223
- Bile acids**, 2–3
 binding and activating PXR, 12
 “Bin size,” 128
- Binding mode**, 476–88

- of chemokine receptors, 479–82
 of chemokines, 476–88
 of hymenaldisine, 346
 of indirubin monoxime, 331
 of inhibitors, 344
 of purvanol, 337
 of PXR, with xenobiotics, 6–7
- Binding site residues
 affinity labeling, 438–39
 effects of mutations on receptor isomerization, 446–47
 identification of direct ligand contacts, 447–48
 implicated in ligand binding, representative, 443–45
 mapping the surface of the binding-site crevice with the substituted-cysteine accessibility method, 449–50
 methods to identify, 438–50
 second-site revertant mutations, 448–49
 site-directed mutagenesis, 439–48
 in the transmembrane domain implicated in ligand binding, 440–42
- Binding sites, 437–67
 aminergic GPCR structure and molecular modeling, 450–54
 on the cytoplasmic domain of NHE1, 536
 general indexing method for residue numbering, 438
 methods to identify binding site residues, 438–50
 second extracellular loop, 454–57
- Bioavailability and pharmacokinetics, 29–32
 absorption and biotransformation of tea catechins, 29–30
 pharmacokinetics of tea polyphenols, 30–32
- Biochemical information processing by ERK, 152–54
 blockade of ERK activation as a synaptic lock, 154
 ERK as a biochemical information storage mechanism, 154
 ERK as a biochemical switch, 153
 ERK as a coincidence detector, 153–54
 ERK as a temporal integrator, 154
- Biochemistry and physiology of S-nitrosothiols, 585–600
 chemistry, 586–87
 S-nitrosothiols, nitric oxide and the blood stream, 592–95
 S-nitrosothiols and signal transduction, 590–92
 S-nitrosothiols as modulators of enzyme activity, 589–90
 stability and biological chemistry, 587–89
- Biogenic amines, 2
- Biology of the spinal cascade induced by tissue injury, 554–56
- circulating factors, 556
- dorsal horn at level of the primary afferent synapse, 555
- neural linkages, 556
- Bioluminescence resonance energy transfer (BRET), 411–12
- Biomedical informatics and pharmacogenomics approaches to pharmacogenomics, 115–16
 biomedical informatics defined, 113–14
 challenges for, 113–33
 comparing genomes to develop pharmacogenomic models, 126
 data exchange standards, 122
 developing communication standards in pharmacogenomics, 121–22
 integrating data from diverse and heterogeneous databases, 123
 managing laboratory information data, 126–27
 mining published literature for pharmacogenomic data, 123–24
 pharmacogenetics and pharmacogenomics defined, 115
 phenotype-to-genotype approaches, 116–17
 protecting confidentiality and privacy of clinical phenotype data, 127–28
 representing the diversity of pharmacogenomic data, 118–20
 understanding structural consequences of genetic variations, 125–26
 using expression data to assess the phenotypes of drug response, 124–25
- Biomedical informatics defined, 113–14
 BIOML, 118
- Biotransformation

- of tea catechins, 29–30
- Biphenyls**
polychlorinated, 4
- BIR**
See *Baculoviral IAP repeat domains*
- Birth defects**
environmentally induced, 181–208
- Bis-aryldifluorophosphonate inhibitors**, 222
- Black tea polyphenols (BTP)**, 32, 39
- Bladder carcinogenesis**
protection against, 40
- Blockades**
of COX isozyme expression, 563
of ERK activation as a synaptic lock, 154
- BOP**
See *N*-Nitroso-bis (2-oxopropyl)amine
- BP**
See *Benz[a]pyrene*
- Brain-derived neurotrophic factor (bdnf)**, 198–99
- Brazil nuts**
allergenicity of, 109–10
- Bromoeno lactone (BEL)**, 558
- BTP**
See *Black tea polyphenols (BTP)*
- N*-Butyl-*N*-(4-hydroxybutyl)nitrosamine, 41
- Butyrolactone**, 328
- C**
- Cadherins**, 286
regulating signaling in the WNT pathway, 301
- Cadherins/β-catenin signaling** by, 299–303
- Caenorhabditis elegans*, 237, 259–62, 264, 528
- Calmodulin**, 537
- Cambridge Crystallographic Database**, 119
- Camellia sinensis*, 26
- cAMP response element binding protein (CREB)**
regulation of phosphorylation in the hippocampus, 150–51
transcription factor, 148–49
- CAMs**
See *Constitutively active mutants*
- Canola**
genetically modified, 100
- Carcinogenesis**
decreased availability of methyl groups causing liver tumors in rodents, 508
DNA methylation and, 506–9
hypermethylation, 508–9
hypomethylation, 506–8
inhibition of, possible mechanisms for, 45–46
maintenance of DNA methylation, 507
as a multistage, multistep process, 502–3
possible epigenetic basis for initiation of, 504–5
possible inverse relationship between susceptibility to carcinogenesis and capacity of maintaining normal patterns of DNA methylation, 509
susceptibility to, 509
- Carcinogenesis inhibition by tea**, 25–54
- antioxidative properties of tea polyphenols, 28–29
bioavailability and pharmacokinetics, 29–32
epidemiological studies on tea and cancer, 41–42
inhibition of tumorigenesis in animal models, 32–41
mechanisms of anticancer activities, 42–46
tea chemistry, 26–28
- Carcinogenesis secondary mechanism**, 501–25
altered DNA methylation as, 515–18
carcinogenesis as a multistage, multistep process, 502–3
cell proliferation and carcinogenesis, 512–14
DNA methylation, 505–6
DNA methylation and carcinogenesis, 506–9
importance of epigenetic mechanisms, 503–5
imprinting, 510–12
interrelationships between mutagenesis, genome stability, and altered DNA methylation, 509–10
significance of secondary mechanism concept, 501–2
- Caspase recruitment domain (CARD)**, 261–62
- Caspases**
FLICE-inhibitory protein, 263–64
inhibition of apoptosis at the level of, 261–64
inhibitors of apoptosis proteins family members, 261–62
- Catechin gallate**, 26, 44
- CBS**
See *Cystathione B-synthase*
- CCR2 inhibitors**, 91
- CCR3 inhibitors**, 90–91
- CCR4 inhibitors**, 92
- Cdc25 inhibitors**, 226–27
structures of

- small-molecule Cdc25 inhibitors, 227
- Cdk5
development of inhibitors, 328–46
inhibition by quinazoline compounds, 344
structural studies of, 327–28
- Celecoxib, 66–67, 69
metabolism of, in humans, 67
- Celera browser, 118
- Cell-cell adhesion receptors
regulation of signaling cascades by, 299–305
- Cell-cycle regulation
modulation of, 44
- Cell death program
activation of, 272
- Cell line studies, 42–45
inhibition of apoptosis, 43–44
inhibition of invasiveness and angiogenesis, 45
inhibition of MAP-kinases, AP-1, and related activities, 43
inhibition of NF κ B and related activities, 43
interference on receptor binding and related activities, 44–45
modulation of cell-cycle regulation, 44
- Cell proliferation
and carcinogenesis, 512–14
effect of NHE1 activity on, 541
multiple factors controlling DNA methylation, 514
in multistage carcinogenesis, 504
varied roles alterations in DNA methylation play in carcinogenesis, 513–14
- Cell Signaling Network
- Database, 119, 126
- Cell survival and apoptosis, 540–42
- Cellular actions of NHE1, 538–43
cell survival and apoptosis, 540–42
cytoskeletal organization and migration, 542–43
effect of NHE1 activity on cell proliferation, 541
proliferation, 539–40
- Cellular mechanisms for the repression of apoptosis, 259–81
at the level of caspases, 261–64
at the level of the mitochondria, 264–68
at the level of the plasma membrane, 268–72
- Cellular pharmacogenomic data, 119
- Cellular retinoic acid binding protein (CRABP), 195
- Cellular retinol binding protein (CRBP), 194–95
- Central nervous system (CNS)
actions of COX inhibitors in man, 568–69
COX isozyme inhibition in human pain states, 569 and
noninflammatory-induced experimental pain, 568–69
postmitotic neurons of, 143
spinal drug delivery, 569
- CHARMM, 450
- Chelators, 587
- Chemokine inhibitors, 82, 90–92
CCR2 inhibitors, 91
CCR3 inhibitors, 90–91
CCR4 inhibitors, 92
- Chemokine receptors, 479–82
small-molecule antagonists of, 484–88
- Chemokines, 477–79
with known three-dimensional structures and their receptors, 473–74
- Chemoprevention of intestinal tumors by aspirin and other NSAIDs
inhibition of cyclooxygenases, 67–70 mechanisms for, 67–70
- Chenodeoxycholic acid, 12
- Chloroeremomycin, 384
- Cholestasis
potential utility of PXR in treatment of, 12–13
- Cholesterol 7 α -hydroxylase (Cyp7a1), 11
- Ciliary neurotrophic factor (*cntf*), 198
- Circulating factors, 556
- Cisplatin, 33
- Cleft lip/palate (CL/P), 191–72
- Clinical importance of research, 569–70
- Clinical interventions, 171–72
- Clinical pharmacogenomic data, 120
- Clostridia*, 381
- Clotrimazole, 4
- CNS
See Central nervous system
- Co-immunoprecipitation as a tool to determine homo- and heterodimerization, 410–11
- Colon cancer prevention
COX-2 as target for, 55–80
COX-2 inhibitors in the clinic, 66–67

- COX-independent mechanisms, 70–71
- COX inhibition, 62–63
- development of COX-2 inhibitors, 63–66
- discovery of COX-2, 61–62
- kinetics of COX-2 inhibition, 66
- mechanisms for chemoprevention of intestinal tumors by aspirin and other NSAIDs, 67–70
- metabolism of celecoxib in humans, 67
- metabolism of refecoxib in humans, 68
- naturally occurring salicylates, 56
- nonsteroidal anti-inflammatory drugs (NSAIDs) and colorectal cancer, 59–60
- nonsteroidal anti-inflammatory drugs (NSAIDs) and cyclooxygenase, 56–59
- nonsteroidal anti-inflammatory drugs (NSAIDs) use and reduction of adenoma size and number in familial adenomatous polyposis (FAP), 60–61
- risks of chronic NSAID therapy for cancer prevention, 71–72
- structure of COX inhibitors, 65
- structure of NSAIDs and related compounds, 64
- worldwide sales of NSAIDs and COX-2 inhibitors, 69
- Colorectal cancer epidemiological studies relating aspirin intake to reduced mortality from colon cancer, 60 and NSAIDs, 59–60 risk reduction in human sporadic colorectal carcinoma, 59–60
- Combinatorial synthesis of 2,6,9-trisubstituted purines, 336
- Communication standards in pharmacogenomics drug and compound names, 121–22 human gene names and links to other organisms, 121 side effects, 122
- COMPARE analysis, 334, 340
- Comparing genomes to develop pharmacogenomic models, 126
- Conditioning Pavlovian, 137
- Confidentiality of clinical phenotype data protecting, 127–28
- Congenital anomalies defined, 183–84
- CONSAM software, 120
- Constitutive dimerization effect of agonist on the dimers detection, 416–18 vs. ligand-promoted, 414–19
- Constitutive location of spinal COX isozymes, 558–59
- Constitutive spinal localization of PLA2 isozymes, 557
- Constitutively active mutants (CAMs), 446
- Conversion of arachidonic acid to PGH2 by combined action of cyclooxygenase and peroxidase activities of COX, 57
- Coordination of multivalent signaling complexes by A-kinase anchoring protein (AKAP), 238
- Corn insect-resistant, 99–100
- Correlation between effect of mutagenesis and PTPs, 213–14
- Cortical atrophy, 172–73
- Corticosteroids, 92
- Corticosterone, 6
- COSTART, 122
- Cotton genetically modified, 100
- COX-2 as target for colon cancer prevention, 55–80
- COX-2 inhibitors in the clinic, 66–67
- COX-independent mechanisms, 70–71
- COX inhibition, 62–63
- development of COX-2 inhibitors, 63–66
- discovery of COX-2, 61–62
- kinetics of COX-2 inhibition, 66
- mechanisms for chemoprevention of intestinal tumors by aspirin and other NSAIDs, 67–70
- metabolism of celecoxib in humans, 67
- metabolism of refecoxib in humans, 68
- naturally occurring salicylates, 56
- nonsteroidal anti-inflammatory drugs (NSAIDs) and colorectal cancer, 59–60

- nonsteroidal
anti-inflammatory drugs (NSAIDs) and cyclooxygenase, 56–59
- nonsteroidal
anti-inflammatory drugs (NSAIDs) use and reduction of adenoma size and number in familial adenomatous polyposis (FAP), 60–61
- risks of chronic NSAID therapy for cancer prevention, 71–72
- structure of COX inhibitors, 65
- structure of NSAIDs and related compounds, 64
- worldwide sales of NSAIDs and COX-2 inhibitors, 69
- COX-2 inhibitors**
in the clinic, 66–67
development of, 63–66
worldwide sales of, 69
- COX-independent**
mechanisms, 70–71
- COX inhibition**
structural basis of, 62–63
- COX isozyme expression**
regulation of, 565–68
- COX isozyme inhibition**
in human pain states, 569
- COX pharmacology**, 560
- CpGV**
See *Cyda pomonella granulovirus*
- CPLA₂**, 556–57
- CRABP**
See *Cellular retinoic acid binding protein*
- CRBP**
See *Cellular retinol binding protein*
- CREB**
See *cAMP response*
- element binding protein**
CrmA
inhibition of apoptosis by, 263–64
- CSAIDS**
See *Cytokine synthesis anti-inflammatory drugs*
- Cubic ternary complex (CTC) model**
of G protein activation, 351–53, 360
- Current concepts regarding signaling scaffolds**, 306–7
- Current Procedural Terminology**, 120
- Cyclic AMP-dependent protein kinase**, 236
- Cyclin-dependent kinase inhibitors**, 325–48
- binding mode of hymenialdisine**, 346
- binding mode of indirubin monoxime**, 331
- binding mode of inhibitors**, 344
- binding mode of purvanolol**, 337
- combinatorial synthesis of 2,6,9-trisubstituted purines**, 336
- discovery and development of cdk inhibitors**, 328–46
- hymenialdisine**, 345
- indirubin and analogues**, 331
- quinazoline compounds**, 344
- structural studies on cdk2, ATP, and cyclins**, 327–28
- various compounds**, 332–33, 336
- Cyclooxygenase (COX)**
conversion of arachidonic acid to PGH₂, 57
inhibitors of, 67–70, 554
metabolic transformations of PGH₂ to prostaglandins, 58
and NSAIDs, 56–59
- Cyclosporin A**, 81, 92
- Cyda pomonella granulovirus* (CpGV)**, 261
- CYP* expression inducible by xenobiotics**, 2
- CYP3A* subfamily**, 2–15
evidence that PXR is a key regulator of induction by xenobiotics, 6–11
expression and catalytic activity, 2–3
identification of novel PXR target genes, 13
induction by structurally diverse compounds, 3–4
metabolism of endogenous compounds, 3
metabolism of xenobiotics, 2–3
pregnane X receptor (PXR), 5
role of PXR in bile acid homeostasis, 11–13
transcription regulation by pregnane X receptor, 1–23
- X-ray crystal structure of the PXR LBD**, 13–15
- xenobiotic response elements in**, 4–5
- Cyp7a1**
See *Cholesterol 7α-hydroxylase*
- Cyp7B1**
See *Oxysterol 7α-hydroxylase*
- Cyp8B1**
See *Oxysterol 12α-hydroxylase*
- CYP27**
See *Sterol 27-hydroxylase*
- Cyproterone acetate**, 4
- Cystathionine B-synthase**

- (CBS), 190
- Cytochrome P450**
superfamily (CYPs), 1-2
- CYP** expression inducible by xenobiotics, 2
- Cytokine inhibitory**
approaches, 92-93
corticosteroids, 92
immunomodulators, 92
NF- κ B inhibitors, 93
p38 mitogen-activated protein (MAP) kinase inhibitors, 93
phosphodiesterase 4 inhibitors, 92
- Cytokine modulators as novel therapies** for asthma, 81-98
anti-inflammatory cytokines, 88-90
chemokine inhibitors, 82, 90-92
inhibition of proinflammatory cytokines, 87
inhibition of T helper 2 (Th2) cytokines, 82-87
other approaches to cytokine inhibition, 92-93
strategies for inhibiting cytokines, 81-83
- Cytokine synthesis**
anti-inflammatory drugs (CSAIDS), 93
- Cytokines**
suppression of signaling, 86
See also Proinflammatory cytokines; T helper 2 cytokines
- Cytoskeletal organization and migration**, 542-43
- Cytoskeletal scaffolds** in the MAP kinase cascade, 309-10
signal transduction and, 306-11
- D**
- D-ala-D-X dipeptides** production by bacterial ligases, 389
- D-cycloserine (DCS)**, 171-72
- D-serine**, 171
- DAMGO-receptor** complexes, 363, 421, 425-26, 428
- Data exchange standards**, 122
- DBD** See DNA binding domain
- DCI** See Dichloroisoproterenol
- DCS** See D-cycloserine
- Death effector domains (DED)**, 263
- Death inducing signaling complex (DISC)**, 263
- Decaffeinated green tea (DGT)**, 30-31
- Decreased availability of methyl groups causing liver tumors in rodents**, 508
- DED** See Death effector domains
- Delayed Word Recall and Verbal Fluency test**, 168
- Deltorphin II**, 425, 428
- Deschloroflavopiridol**, 329
- Development** of cdk inhibitors, 328-46
of COX-2 inhibitors, 63-66
- Developmental processes**, 184-87
- Dexamethasone**, 3-8
- DGT** See Decaffeinated green tea
- Dichloroisoproterenol (DCI)**, 359-61
- Difluoromethylthiophenols**, 400
- 2,2'-Dihydroxy-di-n-propylnitrosamine**, 41
- Dimerization** co-immunoprecipitation as a tool to determine homo- and heterodimerization, 410-11
constitutive vs. ligand-promoted, 414-19
emerging concept for G protein-coupled receptors ontogeny and function, 409-35
of glycopeptide antibiotics, 385
- Dimers** bioluminescence resonance energy transfer, 411-12
detection in living cells, 411-14
effect of agonist on detection, 416-18
fluorescence resonance energy transfer, 412-14
as signal transducing units, 422-27
- Dimethylamiloride (DMA)**, 530-31
- (\pm)-1-(2,5-Dimethoxy-4-iodophenyl)-2-aminopropane (DOI)**, 359
- 7,12-Dimethylbenz[a]anthracene (DMBA)**, 32, 38, 40
- Dioxins**, 188
- Dipeptides** See D-ala-D-X dipeptides
- Direct activation of MAP kinase cascades by integrins**, 289-91
- Direct regulation of NHE1**, 535-38
additional regulatory sites, 537-38
binding and interaction

- sites on the cytoplasmic domain of NHE1, 536
calmodulin, 537
phosphorylation, 535–37
Direct signaling by integrins, 288–93
direct activation of MAP kinase cascades by integrins, 289–91
focal adhesion kinase (FAK), 288–89
integrin effects on Rho GTPases, 291–93
integrin signaling to the cytoskeleton via Rho GTPases, 292
- DISC**
See Death inducing signaling complex
- Discovery**
of cdk inhibitors, 328–46
of COX-2, 61–62
- Disease and inhibition**, 482–88
of chemokines, 482–88
other inhibitors, 488
other viral protein inhibitors, 483–84
small-molecule antagonists of chemokine receptors, 484–88
viral chemokine homologues, 482–83
- Diverse databases**
integrating data from, 123
- Diversity of**
pharmacogenomic data, 118–20
clinical data, 120
genomic data, 118–19
molecular and cellular data, 119
- DMA**
See Dimethylamiloride
- DMBA**
See 7,12-Dimethylbenz[a]-anthracene
- DNA binding domain (DBD), 5
DNA code
flow of information from, 109
DNA methylation, 505–6
and carcinogenesis, 506–9
decreased availability of methyl groups causing liver tumors in rodents, 508
hypermethylation, 508–9
hypomethylation, 506–8
maintenance of, 507
multiple factors controlling, 514
possible inverse relationship between susceptibility to carcinogenesis and capacity of maintaining normal patterns of DNA methylation, 509
- Dobutamine (DOB), 359–60
- DOI**
See (±)-1-(2,5-Dimethoxy-4-iodophenyl)-2-aminopropane
- Dopaminergic hypothesis, 166
- Dorsal horn at level of the primary afferent synapse, 555
- DPDPE, 426
- Drosophila melanogaster*, 264, 307, 528
- Drug and compound names, 121–22
- Drug efficacy at G protein-coupled receptors, 349–79
- Drug response
using expression data to assess phenotypes of, 124–25
- DuPont, 109
- Dysidea etheria*, 226
- Dysosylum binectariferum*, 329
- E**
- Ebbinghaus, Hermann, 136
- EC**
See (–)-Epicatechin
- ECG**
See (–)-Epicatechin gallate
- ECMs**
See Extracellular matrix proteins
- EcoCYC database**, 126
- Ectromelia* virus (EV), 483
- Effectors of ERK**, 148–52
K⁺ channel Kv4.2, 151–52
regulation of CREB phosphorylation in the hippocampus, 150–51
transcription factor cAMP response element binding protein, 148–49
- Efficacy**
in chemical space, relative prevalence of, 366–67
defined, 349–50
as a directional vector, 353
operational measurement of, 367–70
quality of, 353–54
- EGC**
See (–)-Epigallocatechin
- EGCG**
See (–)-Epigallocatechin gallate
- EGF**
See Epidermal growth factor
- Electrophysiological results**
from typical LTP experiment, 141
- Endogenous compounds**
metabolism of, 3
- Endogenously expressed receptors**
evidence of dimerization for, 427–28

- Endothelium-derived relaxing factor (EDRF), 593
- ENNG
See *N*-Ethyl-*N'*-nitro-*N*-nitrosoguanidine
- Ensembl browser, 118
- Ensemble theory in GPCR dynamics, 354–56
- Enterococci*, 381
- Environmental insult during development
potential consequences of, 185
- Environmentally induced birth defects, 181–208
definitions of congenital anomalies, 183–88
developmental processes, 184–87
gene environment interaction concepts, 188–92
potential consequences of environmental insult during development, 185
proposed molecular mechanisms of known teratogens, 193–99
- Eotaxin, 90
- Epicatechin digallate, 26
- (–)-Epicatechin (EC), 26–27, 29–32, 41
- (–)-Epicatechin gallate (ECG), 26–27, 29–32, 41, 44–45
- Epidemiological studies relating aspirin intake to reduced mortality from colon cancer, 60
on tea and cancer, 41–42
- Epidermal growth factor (EGF), 38, 186, 287, 294
- Epigallocatechin digallates, 26
- (–)-Epigallocatechin (EGC), 26–27, 29–32, 41
bioavailability of, 31
- (–)-Epigallocatechin gallate (EGCG), 26–32, 38–46
bioavailability of, 31
- Epigenetic basis for initiation of carcinogenesis possible, 504–5
- Epigenetic mechanisms and carcinogenesis, 503–4
importance of, 503–5
inheritance considered on a dual level, 503
initiation and cell proliferation in multistage carcinogenesis, 504
possible basis for initiation of carcinogenesis, 504–5
possible key role of increased gene expression without mutation in carcinogenesis, 505
- Epithelial-mesenchymal interactions, 186
- EPSP
See Excitatory postsynaptic potential
- ERK
See Extracellular signal-regulated kinase
- Escherichia casseliflavus*, 391
- E. coli*, 387, 389, 392, 528
- E. faecalis*, 389, 392–93
- E. flavesens*, 391
- E. gallinarum*, 391–92
- Etanercept, 87
- ETC
See Extended ternary complex model
- N*-Ethyl-*N'*-nitro-*N*-nitrosoguanidine (ENNG), 39
- Ethylisopropylamiloride (EIPA), 530
- EV
See *Ectromelia virus*
- Evolution of A-kinase anchoring proteins (AKAPs), 237–38
- Excitatory postsynaptic potential (EPSP), 140
- Expression data using to assess phenotypes of drug response, 124–25
- Extended ternary complex (ETC) model of G protein activation, 351–53
- eXtensible Markup Language (XML), 122
- Extracellular matrix (ECM) proteins, 284
- Extracellular-signal-regulated kinase (ERK), 143
biochemical information processing by, 152–54
as a biochemical information storage mechanism, 154
as a biochemical switch, 153
as a coincidence detector, 153–54
effectors of, 148–52
electrophysiological results from typical LTP experiment, 141
general attributes of regulation, 143–44
Hebb's postulate, 135–36
hippocampal formation, 139
kinases in long-term potentiation, 142–43
in long-term potentiation (LTP), 138–43
in memory, 136–38
mitogen-activated protein kinase cascade in memory, 135–63
in neurons, 146–48
regulation in neurons, 143–48
regulation of, 143–48
as a temporal integrator, 154

F

- Familial adenomatous polyposis (FAP), 60–61
- FAO
See Food & Agriculture Organization
- FAO/WHO decision tree approach to, 103
- FAP
See Familial adenomatous polyposis
- Fat-soluble vitamins, 2, 12
- Fatty acids, 2
- FCA
See Freuds complete adjuvant
- FGF
See Fibroblast growth factor
- Fibroblast growth factor (FGF), 186, 198, 294
- Flavopiridol, 329
- FLICE-inhibitory proteins (FLIPs), 263 and CrmA and p35, 263–64 inhibition of apoptosis by, 263–64
- Fluorescence resonance energy transfer (FRET), 412–14 fluorescent ligands, 414 with GFP, 412–13 homogeneous time resolved, 413 photobleaching, 413
- Fluorescent ligands, 414
- Focal adhesion kinase (FAK), 288–89
- Folate receptor alpha (FR α), 190
- Food & Agriculture Organization (FAO), 100, 102–4, 106–9
- Food and Drug Administration COSTART, 122 Standard Product

- Nomenclature, 122
- Foods produced through agricultural biotechnology, 99–112 application of allergenicity assessment, 109–10 assessment of allergenicity of foods produced through agricultural biotechnology, 101–9 safety of foods produced through agricultural biotechnology, 100–1
- FR α
See Folate receptor alpha
- FRET
See Fluorescence resonance energy transfer
- Freuds complete adjuvant (FCA), 557
- Furchtgott, method of, 367

G

- G protein-coupled receptors (GPCRs), 296–97 co-immunoprecipitation to determine homo- and heterodimerization, 410–11 constitutive vs. ligand-promoted dimerization, 414–19 detection of dimers in living cells, 411–14 dimers as signal transducing units, 422–27 evidence of dimerization for endogenously expressed receptors, 427–28 internalization, 426–27 oligomerization, 364–65 ontogeny and function, 409–35 pharmacological properties of receptor dimers, 420–22

- proposed functional roles for dimerization, 428–29 role of receptor dimerization in endoplasmic reticulum export, 419–20
- GABAergic interneurons, 168
- Gallocatechin gallate, 28
- Gastrointestinal tract inhibition of tumorigenesis in, 38–39
- GCP II
See Glutamate carboxypeptidase II
- GENBANK, 118, 123, 127
- Gene environment interaction concepts, 188–92 gene expression abnormalities, 188–89 teratogenic exposure and the susceptible genotype, 189–92
- Gene expression abnormalities in, 188–89 without mutation in carcinogenesis, possible key role of increased, 505
- Genetic variations understanding structural consequences of, 125–26
- Genomic pharmacogenomic data, 118–19
- GFP
See Green fluorescent protein
- Glucocorticoids, 81
- Glucuronidation, 29
- Glutamate carboxypeptidase II (GCP II), 169
- Glutamate receptors metabotropic, 167
- Glutamatergic mechanisms in schizophrenia, 165–79
- Glutamatergic systems, 166–67
- Glutathione S-transferase (GST), 39, 45

- Glycine, 171
- Glycopeptide antibiotics
bactericidal effect of
vancomycin on
Gram-positive bacteria,
384
- dimerization of, 385
- heptapeptide backbone for
vancomycin and
teicoplanin, 383
- structure and mechanism of
action, 382-84
- structures for vancomycin
and teicoplanin, 382
- Glycopeptide resistance,
381-408
- dimerization of
glycopeptide antibiotics,
385
- mechanism of action of the
vanR-vanS
two-component
regulatory system, 397
- mechanism of vancomycin
resistance in
staphylococci, 394
- in other organisms, 395-96
- regulation of van gene
expression, 396-97
- in staphylococci, 393-94
- in streptococci, 394-95
- Glycopeptide resistance in
enterococci, 386-93
- hydrolysis of D-ala-D-ala
dipeptide by VanX, 390
- orientation of vanH active
site, 388
- production of D-ala-D-X
dipeptides by bacterial
ligases, 389
- resistance mechanism to
vancomycin by *vanHAX*
type resistance, 391
- van* gene clusters that
confer resistance to
glycopeptide antibiotics,
387
- VanA, 386-90
- VanB, 391
- VanC, 391-92
- VanD, 392
- VanE, 392-93
- VanG, 392-93
- Glycopeptide resistance in
staphylococci, 393-94
- mechanism of vancomycin
resistance in
staphylococci, 394
- Glycopeptide resistance in
streptococci, 394-95
- GPCRs
See G protein-coupled
receptors
- Green fluorescent protein
(GFP), 411-12
- Green tea polyphenol fraction
(GTPF), 32, 39, 46
- GSNO, 587-89, 591, 595-96
- GSSG
See Oxidized glutathione
- GST
See Glutathione
S-transferase
- GTPF
See Green tea polyphenol
fraction
- H**
- Haloenol lactone suicide
substrate (HELSS),
558
- Hebb's postulate, 135-36
- HELSS
See Haloenol lactone
suicide substrate
- Heme-thiolate proteins, 1
- Hepatocarcinogenesis
protection against, 39
- Heptapeptide backbone for
vancomycin and
teicoplanin, 383
- Herbicide-tolerant soybeans,
99-100
- Hermissenda*, 141
- Heterodimer may, 426-27
- Heterogeneous databases
integrating data from, 123
- Hippocampus
formation of, 139
- regulation of CREB
phosphorylation in,
150-51
- HIV-1 infection, 363
- inhibitor of, 350
- Holoprosencephaly (HPE),
189
- Homogeneous time resolved
FRET (HTRF), 413
- Human gene names and links
to other organisms, 121
- Human genome browsers,
118
- Human Genome Database,
118
- Human pain states
COX isozyme inhibition in,
569
- Humanized monoclonal
antibody
effect against interleukin-5,
84-85
- Hydrocorticosone, 3
- Hydrolysis of D-ala-D-ala
dipeptide by VanX, 390
- 17 α -Hydroxypregnanolone, 6
- 17 α -Hydroxyprogesterone, 6
- Hymenialdinsine
binding mode of, 346
- inhibition of kinases by,
345
- Hyperforin, 8
- Hypermethylation, 508-9
- Hypomethylation, 506-8
- I**
- ICE
See Interleukin-1 beta
converting enzyme
- Identification
of novel PXR target genes,
13

- of the nuclear receptor PXR, 5
- IFBC**
See International Food Biotechnology Council
- Ig CAMs**
See Immunoglobulin cell adhesion molecule families
- Igf2**
regulation of expression of, 511
- IL-10**, 88–89
- IL-12**, 89–90
- IL-18**, 89–90
- ILK**
See Integrin-linked kinase
- ILSI**
See International Life Sciences Institute
- Immunoglobulin cell adhesion molecule (Ig CAM)**, 283–84
- superfamilies, 287
- Immunomodulators**, 92
- Imprinting**, 510–12
- regulation of expression of *Igf2*, 511
 - regulation of expression of *M6P-Igf2r*, 512
- In silico** screening, 15
- In vivo** COX-1 and COX-2 localization in spinal cord, 559
- In vivo** factors
- in signal transduction pathways, 567–68
- Indirubin and analogues, 330
- inhibition of cyclin dependent kinases by, 331
- Indirubin monoxime binding mode of, 331
- Inducible nitric oxide (iNOS), 43
- Induction
- of *CYP3A* genes by structurally diverse compounds, 3–4
 - of spinal COX isozymes, 559–60
 - of spinal PLA₂ isozymes, 557
- Infliximab, 87
- Information
- managing laboratory, 126–27
- Inheritance
- considered on a dual level, 503
- Inhibition
- binding mode of, 344
 - of cdk5 by quinazoline compounds, 344
 - of cyclooxygenases, 67–70
 - of cytokines, strategies for, 81–83
 - of invasiveness, and angiogenesis, 45
 - of kinases by hymenialdisine, 345
 - of mammary gland tumorigenesis, 40
 - of MAP-kinases, AP-1, and related activities, 43
 - of multi-organ tumorigenesis, 41
 - of NFκB and related activities, 43
 - of STAT-6, 86
- Inhibition of apoptosis, 43–44
- Bcl-2 family members, 265–68
- FLICE-inhibitory protein, 263–64
- ionic repression of apoptosis, 270–72
- at the level of caspases, 261–64
- at the level of the mitochondria, 264–68
- at the level of the plasma membrane, 268–72
- volume regulatory responses, 269–70
- Inhibition of apoptosis proteins (IAP) family members, 261–62
- Inhibition of carcinogenesis by tea, 25–54
- antioxidative properties of tea polyphenols, 28–29
- bioavailability and pharmacokinetics, 29–32
- epidemiological studies on tea and cancer, 41–42
- inhibition of tumorigenesis in animal models, 32–41
- mechanisms of anticancer activities, 42–46
- tea chemistry, 26–28
- Inhibition of cyclin-dependent kinases, 325–48
- binding mode of hymenialdisine, 346
- binding mode of indirubin monoxime, 331
- binding mode of inhibitors, 344
- binding mode of purvanolol, 337
- combinatorial synthesis of 2,6,9-trisubstituted purines, 336
- discovery and development of cdk inhibitors, 328–46
- inhibition by compounds, 332–33, 336
- inhibition by hymenialdisine, 345
- inhibition by indirubin and analogues, 331
- inhibition by quinazoline compounds, 344
- structural studies on cdk2, ATP, and cyclins, 327–28
- Inhibition of proinflammatory cytokines, 87
- anti-IL-1, 87
- anti-TNF, 87

- Inhibition of T helper 2 (Th2)
 cytokines, 82–87
 anti-IL-4, 85–86
 anti-IL-5, 82–85
 anti-IL-9, 87
 anti-IL-13, 86–87
 effect of humanized monoclonal antibody against interleukin-5, 84–85
- Inhibition of tumorigenesis in animal models, 32–41
 inhibition of mammary gland tumorigenesis, 40
 inhibition of multi-organ tumorigenesis, 41
 inhibition of tumorigenesis in gastrointestinal tract, 38–39
 inhibitory action against transplantable tumors, 41
 protection against hepatocarcinogenesis, 39
 protection against lung tumorigenesis, 33, 38
 protection against pancreatic and bladder carcinogenesis, 40
 protection against skin tumorigenesis, 32–33
- Inhibition of tumorigenesis in gastrointestinal tract, 38–39
- Inhibitory action against transplantable tumors, 41
- Initiation
 in multistage carcinogenesis, 504
- INOS
 See Inducible nitric oxide
- Insect-resistant corn, 99–100
- Integrating data
 from diverse and heterogeneous databases, 123
- Integrin and cytoskeletal modulation
 of the RTK/Ras/MAPK cascade, 293–96
 of signaling through cytokine receptors, 297–99
 of signaling through G protein-coupled receptors, 296–98
- Integrin effects on Rho GTPases, 291–93
- Integrin-linked kinase (ILK), 302
- Integrin modulation of signal transduction cascades, 293–99
- integrin and cytoskeletal modulation of signaling through cytokine receptors, 297–99
 integrin and cytoskeletal modulation of signaling through G protein-coupled receptors, 296–98
 integrin and cytoskeletal modulation of the RTK/Ras/MAPK cascade, 293–96
- Integrin signaling to the cytoskeleton via Rho GTPases, 292
- Integrins, 284–86
- Interaction sites
 on the cytoplasmic domain of NHE1, 536
- Interference on receptor binding and related activities, 44–45
- Interferons, 89
- Interleukin-1 beta converting enzyme (ICE), 263, 271
- Internalization, 363, 426–27
- International Classification of Diseases standard, 120
- International Food Biotechnology Council (IFBC), 102
- International Life Sciences Institute (ILSI) Allergy & Immunology Institute, 102
- Interrelationships between mutagenesis, genome stability, and altered DNA methylation, 509–10
- Intracellular cyclic AMP, 92
- Intrathecal cyclooxygenase inhibitors
 in rat models of nociception, 561–62
- Invasiveness inhibition of, and angiogenesis, 45
- Ionic repression of apoptosis, 270–72
- Ionotropic glutamate receptors, 167
- IPLA₂, 557
- Ircinia*, 226
- Isoproterenol (ISO), 359
- J**
 James, William, 136
- K**
 K^+ channel Kv4.2, 151–52
 Kaposi's sarcoma, 482
 KEGG
 See Kyoto Encyclopedia of Genes and Genomes
- Kenpaulone, 330
- Kinases
 inhibition by hymenialdisine, 345
 in long-term potentiation, 142–43
- Kinetics
 of COX-2 inhibition, 66
 of receptor activation, 362
- Kyoto Encyclopedia of Genes and Genomes (KEGG), 126

- L**
- Laboratory information management systems (LIMS), 126–27
- Lactobacillus pentosus*, 386
- Lamellipodia, 542
- Lansoprazole, 4
- LBD
- See Ligand-binding domain
- LCA
- See Lithocholic acid
- Leuconostoc mesenteroides*, 395
- Leukotrienes, 2
- LHRH
- See Lutenizing hormone-releasing hormone
- Ligand-binding domain (LBD), 5, 7
- residues in the transmembrane implicated in, 440–45
- signaling by, 303–4
- Ligand-selective receptor conformations for receptor signaling, 358–60
- and therapeutic utility, 362
- Ligand-selective receptor states, 356–58
- LIMS
- See Laboratory information management systems
- Linkage theory
- models of GPCRs
 - described with, 352
- Lithocholic acid (LCA), 3, 8
- Long-term depression (LTD), 140–43
- Long-term memory (LTM), 137, 139–41
- Long-term potentiation (LTP), 140, 142–43
- Lung tumorigenesis
- protection against, 33, 38
- Lutenizing hormone-releasing hormone (LHRH), 422
- LY311727, 558
- LY333328, 398–99
- M**
- M6P-Igf2r*
- regulation of expression of, 512
- Macrophage chemoattractant protein (MCP), 90, 425
- Madin-Darby canine kidney (MDCK) cells, 542
- MAFF
- See Methyl arachidonyl fluorophosphonate
- mAkAP
- negative feedback loop coordinated by, 240
 - signaling complex at the perinuclear membrane of cardiomyocytes, 239–41
 - signaling complex at the sarcoplasmic reticulum, 241–42
- MAML
- See MicroArray Markup Language
- Mammary gland tumorigenesis inhibition of, 40
- MAP kinase kinase (MAPKK), 144–45, 306
- MAP kinase kinase kinase (MAPKKK), 144–45, 306
- MAP kinases (MAPKs), 288, 567
- inhibition of, 43
- MAPK signaling cascades superfamily of, 144–46
- Mapping with the substituted-cysteine
- accessibility method, 449–50
- MAPs
- See Mitogen-activated proteins
- Mathematical and operational treatment of efficacy, 351–53
- MCP
- See Macrophage chemoattractant protein
- MDC
- See Monocyte-derived chemokine
- MDCK
- See Madin-Darby canine kidney cells
- MDR
- See Multidrug resistance
- Mediated signal transduction, 235–57
- coordination of multivalent signaling complexes, 238
 - cyclic AMP-dependent protein kinase, 236
 - evolution of AKAP, 237–38
 - muscle A-kinase anchoring proteins, 238–48
 - regulation of PKA by AKAP, 236–37
- Medical Subject Heading keywords, 121
- MEDLINE database, 121
- Medline/PubMED, 123
- Melanocortin-stimulating hormone (MSH) receptor, 422
- Mepolizumab, 84–85
- Met-RANTES, 91
- Metabolic transformations of PGH₂ to prostaglandins, 58
- Metabolism
- of celecoxib in humans, 67
 - of endogenous compounds, 3

- of refecoxib in humans, 68
of xenobiotics, 2-3
- Metabotropic glutamate receptors, 167
- Metallonitrosyls, 585
- Metalloproteinases (MMP), 45
- Methanethiosulfonate (MTS), 449
- Methicillin-resistant *Staphylococcus aureus* (MRSA), 381
- Methionine synthase (MS), 190
- Methionine synthase reductase (MTRR), 190
- Methyl arachidonyl fluorophosphonate (MAFP), 557
- 3-*O*-Methyl EC, 26
- N*-Methyl-*N'*-nitro-*N*-nitrosoguanidine (MNNG), 39
- Methylated catechins, 29
- Methylation heritable, aberrant patterns of, 517
normal patterns of, 517
- 5,10-Methylene-tetrahydrofolate reductase (MTHFR), 190
- Methylenetetrahydrofolate dehydrogenase (MTHFD), 190
- (4-Methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK), 33, 38-39
- N*-Methylnitrosourea, 41
- α -ethylprednisolone, 3
- 5-*N*-(Methylpropyl)amiloride (MPA), 531
- MGluR functioning, 141
- Microarray Gene Expression Database, 119
- MicroArray Markup
- Language (MAML), 119
- Mifepristone (RU486), 3-4, 6, 8
- Mini Mental State Exam, 168
- Mitochondria Bcl-2 family members, 265-68
inhibition of apoptosis at the level of, 264-68
- MKP3 substrate recognition mechanism of, 219-20
- MMP See Metalloproteinases
- MNNG See *N*-Methyl-*N'*-nitro-*N*-nitrosoguanidine
- Modeller, 450
- Molecular basis of environmentally induced birth defects, 181-208
definitions of congenital anomalies, 183-84
developmental processes, 184-87
gene environment interaction concepts, 188-92
potential consequences of environmental insult during development, 185
proposed molecular mechanisms of known teratogens, 193-99
- Molecular basis of phospho-peptides recognition by PTP1B, 214-17
- Molecular mechanisms of known teratogens, 193-99
retinoids, 194-97
thalidomide, 193-94
valproic acid, 197-99
- Molecular model for NMDA receptor regulation by
- ytiao-anchored PKA and PPI, 247-48
- Molecular pharmacogenomic data, 119
- Molecular physiology of NHE1, 530
- Molecular psychology biochemical information processing by ERK, 152-54
effectors of ERK, 148-52
ERK in long-term potentiation (LTP), 138-43
ERK in memory, 136-38
Hebb's postulate, 135-36
hippocampal formation, 139
regulation of ERK in neurons, 143-48
roles for the extracellular-signal regulated kinase (ERK)/mitogen-activated protein kinase (MAPK) kinase cascade in memory, 135-63
- Molluscum contagiosum*, 483
- Monocyte-derived chemokine (MDC), 92
- Morris water maze task, 141
- Mossy fiber path, 140
- MPA See 5-*N*-(Methylpropyl) amiloride
- MRSA See Methicillin-resistant *Staphylococcus aureus*
- MS See Methionine synthase
- MSH See Melanocortin-stimulating hormone receptor
- MTHFD See Methylenetetrahydrofolate

- dehydrogenase
- MTHFR
See 5,10-Methylene-tetrahydrofolate reductase
- MTRR
See Methionine synthase reductase
- MTS
See Methanethiosulfonate
- Multi-organ tumorigenesis inhibition of, 41
- Multidrug resistance (MDR), 8, 10, 13
- Multiple factors controlling DNA methylation, 514
- Multistage carcinogenesis initiation and cell proliferation in, 504
- Muscle A-kinase anchoring proteins (mAKAPs), 238-48
- AKAP220, 242-43
- AKAP220 signaling complexes, 244
- AKAP 350/450/CG-NAP coordinated signaling complexes, 246-47
- AKAP 350/450/CG-NAP/YOTIAO, 244-46
- mAKAP signaling complex at the perinuclear membrane of cardiomyocytes, 239-41
- mAKAP signaling complex at the sarcoplasmic reticulum, 241-42
- molecular model for NMDA receptor regulation by yotiao-anchored PKA and PPI, 247-48
- negative feedback loop coordinated by mAKAP, 240
- RII binding enhancing PPI
- inhibition by AKAP220, 245
- yotiao and NMDA receptor function, 247-48
- Mutagenesis site-directed, 439-48
- Mutagenic potential, 182-83
- Myophenolate, 81
- N**
- N-acetyl aspartate (NAA), 166
- N-acetyl aspartyl glutamate (NAAG), 169
- N-methyl-D-aspartate (NMDA) receptor, 307, 556, 563, 565
- Na^+/H^+ exchanger (NHE1) cellular actions of, 538-43 effect on cell proliferation, 541 molecular physiology of, 530 pharmacological inhibition of, 530-32 regulation of, 532-38 signaling networks regulating, 533-35 structural topology of, 528-30 structure, regulation, and cellular actions, 527-52
- NADPH-quinone oxidoreductase, 45
- National Center for Biotechnology Information (NCBI) browser, 118
- National Library of Medicine Unified Medical Language System project, 121
- Natural language processing (NLP) techniques, 123
- NCBI
See National Center for Biotechnology Information
- NDEA
See *N*-Nitrosodiethylamine
- Negative feedback loop coordinated by mAKAP, 240
- Nerve growth factor (NGF), 186, 198-99
- Netherland Cohort Study on Diet and Cancer, 42
- Networks
See Signaling networks
- Neural glial cell adhesion molecule (Ng CAM), 287
- Neural linkages, 556
- Neural tube closure (NTC), 197
- Neural tube defects (NTDs), 190-91, 197-98
- Neurokinin-1 (NK1), 556
- NF κ B, 567
inhibition of, 43, 93
- Ng CAM
See Neural glial cell adhesion molecule
- NGF
See Nerve growth factor
- NHE1
See Na^+/H^+ exchanger
- NHEK
See Normal human epidermal keratinocytes
- Nitric oxide
and the blood stream, 592-95
- N*-Nitroso-bis(2-oxopropyl)amine (BOP), 40
- N*-Nitrosodiethylamine (NDEA), 33, 39, 41
- N*-Nitrosomethylbenzylamine (NMBzA), 39
- NK1
See Neurokinin-1
- NMBzA
See *N*-Nitrosomethylbenzylamine

- NMDA
See N-methyl-D-aspartate receptor
- NMDA receptor function
yotiao and, 247-48
- NNK
See
(4-Methylnitrosamino)-1-(3-pyridyl)-1-butanone
- NNT
See "Numbers-needed-to-treat"
- Nociceptive processing
antihyperalgesic vs. analgesic actions of NSAIDs, 554
- biology of the spinal cascade induced by tissue injury, 554-56
- central nervous system actions of COX inhibitors in man, 568-69
- clinical importance of research, 569-70
- regulation of spinal PLA₂ and COX isozyme expression, 565-68
- role of constitutive vs. inducible spinal COX-2 in, 568
- spinal cyclooxygenase (COX) isozymes, 558-63
- spinal phospholipase A₂ (PLA₂) isozymes, 556-58
- spinal phospholipase-cyclooxygenase-prostanoid cascade in, 553-83
- spinal prostaglandins (PG), 563-65
- Noninflammatory-induced experimental pain, 568-69
- NONMEM software, 120
- Nonsteroidal anti-inflammatory drugs
- (NSAIDs)
and colorectal cancer, 59-60
and cyclooxygenase, 56-59
epidemiological studies relating aspirin intake to reduced mortality from colon cancer, 60
and metabolic transformations of PGH₂ to prostaglandins, 58
and reduction of adenoma size and number in familial adenomatous polyposis, 60-61
and risk reduction in human sporadic colorectal carcinoma, 59-60
worldwide sales of, 69
- Normal distributions of receptor microstates, 355
- Normal human epidermal keratinocytes (NHEK), 43
- Normal patterns of DNA methylation, 517
- possible inverse relationship to susceptibility to carcinogenesis, 509
- Novel genes
source of, 102-4
- Novel proteins
level of expression of, 109
- NTC
See Neural tube closure
- NTDs
See Neural tube defects
- NU2058, 339
- NU6027, 340
- NU6102, 341
- Nuclear receptor PXR
identification of, 5
- "Numbers-needed-to-treat" (NNT), 553
- O**
- O-nitroso compounds, 585
- Oatp2
See Organic anion transporter 2
- Olomoucine, 334, 336-37
- Omeprazole, 4
- OMIM
See Online Mendelian Inheritance in Man database
- Online Mendelian Inheritance in Man (OMIM) database, 119, 123
- OpNPV
See *Orrgyia pseudotsugata nucleopolyhedrovirus*
- Organic anion transporter 2 (Oatp2), 11-12
- Organochloride pesticides, 4
- Oritavancin, 398
- Orrgyia pseudotsugata nucleopolyhedrovirus* (OpNPV), 261
- Oxidized glutathione (GSSG), 587-88, 591, 595-96
- Oxidoreductase
NADPH-quinone, 45
- Oxysterol 7 α -hydroxylase (Cyp7B1), 11
- Oxysterol 12 α -hydroxylase (Cyp8B1), 11
- P**
- P21 activated kinase (PAK), 291, 308
- p35
inhibition of apoptosis by, 263-64
- P38 mitogen-activated protein kinase inhibitors, 93
- Paclitaxel, 4
- PACT
See Pericentrin-AKAP450
- centrosomal targeting domain

- Paenibacillus popilliae*, 395
- Pain**
See Human pain states
- PAK**
See p21 activated kinase
- Pancreatic carcinogenesis**
protection against, 40
- Papaya**
virus-resistant, 100
- Pathways**
See Signal transduction pathways; Sonic hedgehog pathway; WNT pathway
- Paullones**, 330
- Pavlovian conditioning**, 137
- PBREM**
See
Phenobarbital-responsive enhancer module region
- PCN**
See Pregnenolone 16 α -carbonitrile
- PDB**
See Protein Data Bank
- PDGF**
See Platelet-derived growth factor
- Peptidoglycan**, 383–84
- Pericentrin-AKAP450**
centrosomal targeting (PACT) domain, 246
- Peroxisome Proliferator Activated Receptors (PPARs)**, 58
- Pesticides**
organochloride, 4
- PET**
See Positron emission tomographic studies
- Pharmacogenetics**
defined, 115
- Pharmacogenomic data**
clinical, 120
diversity of, 118–20
genomic, 118–19
molecular and cellular, 119
- Pharmacogenomics**
approaches to, 116
defined, 115
- Pharmacokinetics**
of tea polyphenols, 30–32
- Pharmacological agents**
currently used to inhibit NHE1 activity, 531
- Pharmacological inhibition of NHE1**, 530–32
- classes of pharmacological agents currently used to inhibit NHE1 activity, 531
- Pharmacological properties of ligands**, 357
- of receptor dimers, 420–22
- Pharmacological specificity**
structural bases of, 452–54
- PharmGKB database**, 122, 128
- Phencyclidine (PCP) link**, 167–68
- Phenobarbital**, 4
- Phenobarbital-responsive enhancer module region (PBREM)**, 10
- Phenotype-to-genotype approaches**, 116–17
- Phenotypes of drug response**
using expression data to assess, 124–25
- Phenylbutazone**, 4
- Phenytoin**, 4
- Phosphodiesterase 4 inhibitors**, 92
- Phosphorylation**, 535–37
of tyrosine, 209–10
- Photobleaching FRET (pbFRET)**, 413
- Pioneer Hi-Bred International**, 109
- PKA**
coupling to ERK2, 147
regulation by A-kinase anchoring protein, 236–37
- PLA₂ pharmacology**, 557–58
- Plasma membrane**
inhibition of apoptosis at the level of, 268–72
ionic repression of apoptosis at, 270–72
volume regulatory responses at, 269–70
- Plasticity**
“synaptic,” 136, 142
- Platelet-derived growth factor (PDGF)**, 186, 294
- Polychlorinated biphenyls**, 4
- Polymorphism**
A1298C, 190
- Positron emission tomographic (PET) studies**, 166, 170
- Potatoes**
genetically modified, 100
- PPAR δ gene**, 58–59, 71
- PPARs**
See Peroxisome Proliferator Activated Receptors
- 5 β -Pregnane-3,20-dione**, 6, 8
- Pregnane X receptor (PXR)**, 5
bile acids binding and activating, 12
binding to response elements in xenobiotic inducible genes, 9
binding to xenobiotic response elements in CYP3A promoters, 7–10
chemical structures of xenobiotic and endogenous compounds known to activate, 8
expression patterns of, 6
identification of the nuclear receptor PXR, 5
as a key regulator of CYP3A induction by xenobiotics, 6–11
potential utility in treatment of cholestasis, 12–13
regulating CYP3A gene

- transcription, 1–23
 regulating genes involved in bile acid synthesis, transport, and metabolism, 11–12
 role in bile acid homeostasis, 11–13
 targeted disruption of the PXR gene in mice, 10–11
 transgenic models, 11
 xenobiotics binding and activating, 6–7
- Pregnenolone**
 16 α -carbonitrile (PCN), 2, 8
- Primary sequence**, 471–72
- Privacy of clinical phenotype data**
 protecting, 127–28
- Proinflammatory cytokines**
 inhibition of, 87
- Proliferation**, 539–40
- Proline-directed**
 serine/threonine kinases, 144
- Prostaglandin receptors**, 564
- Prostaglandins**, 2
- Prostanoids**, 554
 synthesis of, 563
- Protean agonism**, 360–61
- Protein allergenicity**
 assessment of foods produced through agricultural biotechnology, 99–112
 application of allergenicity assessment, 109–10
 assessment of allergenicity of foods produced through agricultural biotechnology, 101–9
 foods produced through agricultural biotechnology, 99–100
 safety of foods produced through agricultural biotechnology, 100–1
- Protein Data Bank (PDB)**, 119, 123, 125
- Protein kinase A (PKA)**, 308
- Protein kinase database**, 119
- Protein tyrosine phosphatase (PTP) inhibitor development**
 Cdc25 inhibitors, 226–27
 PTP1B inhibitors, 221–26
- Protein tyrosine phosphatase (PTP) structure and function**, 210–20
- correlation between effect of mutagenesis and PTPs**, 213–14
- functional significance of PTP1B active site plasticity**, 217–19
- mechanism of MKP3 substrate recognition**, 219–20
- molecular basis of phospho-peptides recognition by PTP1B**, 214–17
- PTP substrate specificity**, 212–14
- Proteins**
 heme-thiolate, 1
- Proteoglycans**
 signaling by, 305
- PTP substrate specificity**, 212–14
- PTP1B active site plasticity**
 functional significance of, 217–19
- PTP1B inhibitors**, 221–26
 strategy for creating selective and high-affinity PTP1B inhibitors, 223
 structures of difluorophosphonate-containing PTP1B inhibitors, 224
 structures of nonphosphorus small-molecule PTP1B
- inhibitors**, 225
- Published literature**
 mining for pharmacogenomic data, 123–24
- Purvanolol**
 binding mode of, 337
- PXR**
 See *Pregnane X receptor*
- PXR LBD**
 X-ray crystal structure of, 13–15
- PXR target genes**
 Identification of novel, 13
- Q**
- Quaternary structures**, 474–76
- Quinazoline compounds**
 inhibition of cdks by, 344
- Quinazoline ring system template**, 342–44
- R**
- RANTES**
 See *Regulated on activation, normal T cell-expressed and -secreted*
- Rapamycin**, 92
- RARs**
 See *Retinoic acid receptors*
- Rat neonatal ventriculocytes (RVN)**, 239
- Reactive oxygen species (ROS)**, 267
- Receptor dimerization**
 role in endoplasmic reticulum export, 419–20
- Receptor genotype vs. phenotype**
 “conditional” efficacy of, 365–66
- Receptor microstates**
 normal distributions of, 355
- Receptor systems**

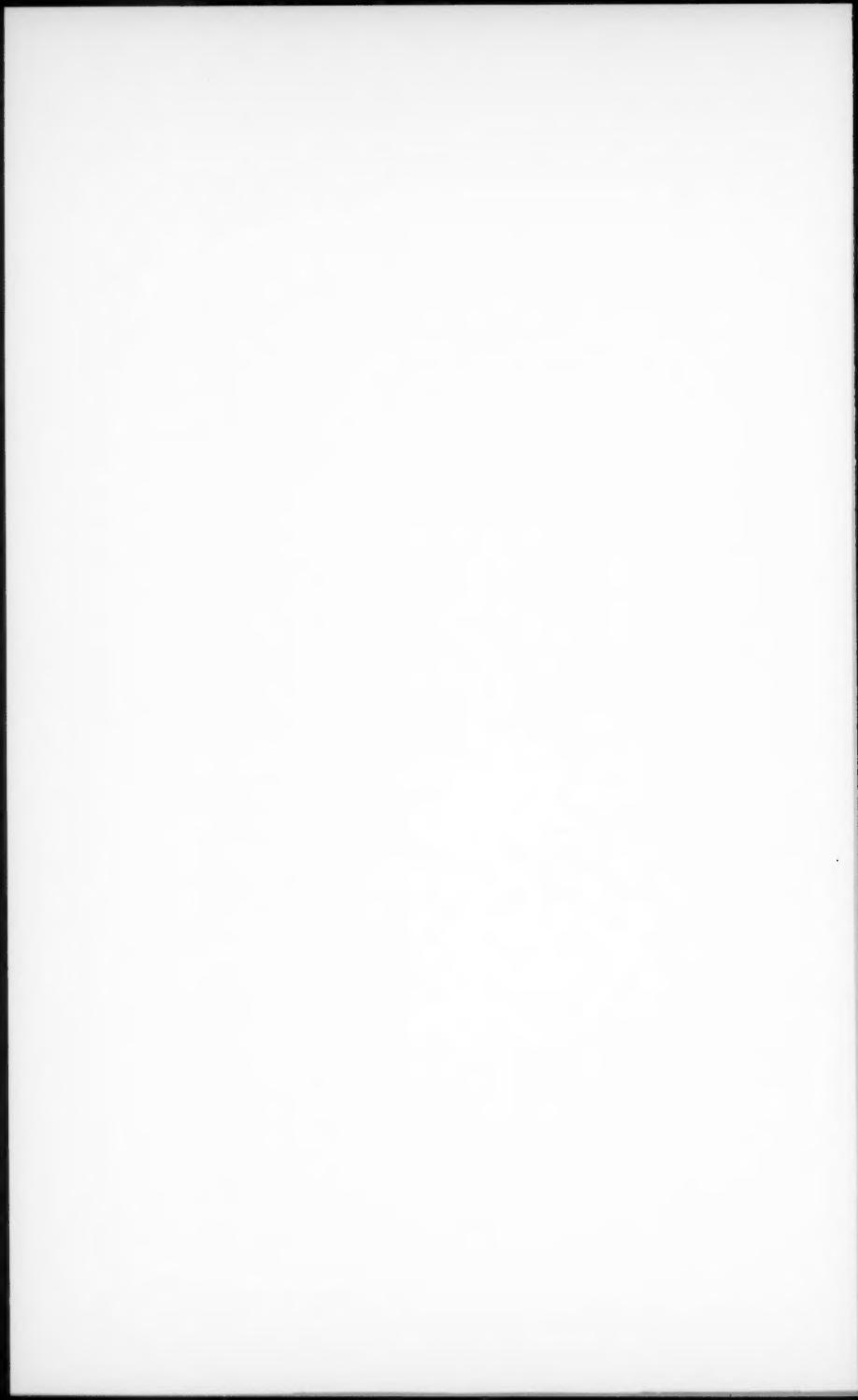
- stimulus-response mechanisms of, 370
- Receptor tyrosine kinase (RTK), 293, 310
- Receptors activation of, 454 phosphorylation and desensitization of, 362–63
- See also Glutamate receptors; Retinoic acid receptors; Retinoid X receptors
- Red fluorescent protein (RFP), 412
- Reduced folate carrier (RFC), 190
- Refecoxib metabolism of, in humans, 68
- Regulated on activation, normal T cell-expressed and -secreted (RANTES), 90–91, 350, 425, 478–79, 482, 484, 486
- Regulation of CREB phosphorylation in the hippocampus, 150–51
- of expression of *Igf2*, 511
- of expression of *M6P-Igf2r*, 512
- of PKA by A-kinase anchoring protein, 236–37
- of van gene expression, 396–97
- Regulation of *CYP3A* gene transcription by pregnane X receptor (PXR), 1–23
- CYP3A* subfamily, 2–15
- cytochrome P450 superfamily (CYPs), 1–2
- Regulation of ERK in neurons, 143–48
- general attributes of, 143–44
- PKA coupling to ERK2, 147
- superfamily of MAPK signaling cascades, 144–46
- Regulation of NHE1 activity, 532–38
- direct, 535–38
- signaling networks for, 533–35
- Regulation of signaling cascades by cell-cell adhesion receptors, 299–305
- by cadherins/β-catenin, 299–303
- by Ig CAMs, 303–4
- by proteoglycans, 305
- by selectins, 304–5
- in the WNT pathway by cadherins, 301
- Regulation of spinal PLA₂ and COX isozyme expression, 565–68
- factors regulating spinal PLA₂-COX-2 induction, 565–66
- signal transduction pathways linked to transcriptional activation, 566–68
- Regulatory responses volume, 269–70
- Regulatory sites, 537–38
- Regulatory volume decrease (RVD), 269
- Regulatory volume increase (RVI), 269–71
- Release of spinal prostanoids, 564
- Renilla reniformis*, 411
- Repression of apoptosis ionic, 270–72
- Residue numbering general indexing method for, 438
- Residues in the transmembrane domain implicated in ligand binding, 440–45
- Resistance to pepsin, 107 to vancomycin by *vanHAX* type resistance, 391
- Resource Description Framework, 122
- Retinoic acid receptors (RARs), 194–96
- Retinoid X receptors (RXRs), 194, 196
- Retinoids, 194–97
- RFC See Reduced folate carrier
- RFP See Red fluorescent protein
- Rhodopsin, 450, 454
- Rifampicin, 4–8, 16
- RII binding enhancing PPI inhibition by AKAP220, 245
- RING domains, 262
- Risks of chronic NSAID therapy for cancer prevention, 71–72
- reducing in human sporadic colorectal carcinoma, 59–60
- Rofecoxib, 66–67, 69
- Rohitukine, 329
- Role of constitutive vs. inducible spinal COX-2 in nociceptive processing, 568
- ROS See Reactive oxygen species
- Roscovitine, 334, 336, 338
- RSNO, 585–89, 595
- RTK See Receptor tyrosine kinase
- RU486 See Mifepristone

- RVD
See Regulatory volume decrease
- RVI
See Regulatory volume increase
- RXRs
See Retinoid X receptors
- S**
- S-adenosylmethionine (SAM), 507
- S-nitrosoglutathione, 587
- S-nitrosothiols, 585, 589
and the blood stream, 592–95
as modulators of enzyme activity, 589–90
and signal transduction, 590–92
- SAAM 30 software, 120
- Saccharomyces cerevisiae*, 528
- Safety
of foods produced through agricultural biotechnology, 100–1
- Salicylates
naturally occurring, 56
- Salmon
genetically modified, 100
- SAM
See S-adenosylmethionine
- Schaffer-collateral path, 140
- Schizophrenia
glutamatergic mechanisms in, 165–79
- Schizosaccharomyces pombe*, 528
- Second extracellular loop, 437–67, 454–57
- Second-site revertant mutations, 448–49
- Secondary mechanism concept
significance of, 501–2
- Secondary structure, 472
- Selectins, 287–88
signaling by, 304–5
- Sequence homology to known allergens, 104–5
tests for, 105
- Serum screening specific, 105–6
targeted, 106–7
- SHH
See Sonic hedgehog pathway
- Signal transduction
adhesion receptor families, 284–88
by cell adhesion receptors, and the cytoskeleton, 283–323
and cytoskeletal scaffolds, 306–11
direct signaling by integrins, 288–93
mediated, 235–57
- Signal transduction cascades
integrin modulation of, 293–99
regulation by cell-cell adhesion receptors, 299–305
- Signal transduction
knowledge environment (STKE), 126
- Signal transduction pathways linked to transcriptional activation, 566–68
- MAP kinases (MAPKs), 567
- NF-kappaB, 567
- steroids, 567
- in vivo factors, 567–68
- Signaling
by cadherins/β-catenin, 299–303
by Ig CAMs, 303–4
by integrins, direct, 288–93
by proteoglycans, 305
by selectins, 304–5
- in the WNT pathway, cadherins regulating, 301
- Signaling cascades
regulation by cell-cell adhesion receptors, 299–305
- Signaling networks
regulating NHE1, 533–35
- Signaling scaffolds
current concepts regarding, 306–7
cytoskeleton as, 307–11
in the MAP kinase cascade, 309–10
- Site-directed mutagenesis, 439–48
effects of mutations on receptor isomerization, 446–47
identification of direct ligand contacts, 447–48
- Skin tumorigenesis
protection against, 32–33
- Small-molecule antagonists
of chemokine receptors, 484–88
- SNAP, 589–91
- Sonic hedgehog (SHH) pathway, 189
- Soybeans
herbicide-tolerant, 99–100
- Specific serum screening, 105–6
- Spinal cyclooxygenase (COX) isozymes, 558–63
blockade of COX isozyme expression, 563
constitutive location of spinal COX isozymes, 558–59
induction of, 559–60
induction of spinal COX isozymes, 559–60
intrathecal cyclooxygenase inhibitors in rat models of nociception, 561–62

- pharmacology of, 560
in regulating hyperalgesic behavior, 560–63
in vivo COX-1 and COX-2 localization in spinal cord, 559
- Spinal drug delivery, 569
- Spinal phospholipase A₂ (PLA₂) isozymes, 556–58
constitutive spinal localization of PLA₂ isozymes, 557
- cPLA₂, 556–57
induction of spinal PLA₂ isozymes, 557
- iPLA₂, 557
- PLA₂ pharmacology, 557–58
spinal PLA₂ in regulating hyperalgesic behavior, 558
- sPLA₂, 557
- Spinal phospholipase-cyclooxygenase-prostanoid cascade in nociceptive processing, 553–83
antihyperalgesic vs. analgesic actions of NSAIDs, 554
biology of the spinal cascade induced by tissue injury, 554–56
central nervous system actions of COX inhibitors in man, 568–69
clinical importance of research, 569–70
regulation of spinal PLA₂ and COX isozyme expression, 565–68
role of constitutive vs. inducible spinal COX-2 in nociceptive processing, 568
spinal cyclooxygenase (COX) isozymes, 558–63
- spinal phospholipase A₂ (PLA₂) isozymes, 556–58
- spinal prostaglandins (PG), 563–65
- Spinal PLA₂ isozymes, induction of, 557
in regulating hyperalgesic behavior, 558
regulation of, 565–68
- Spinal PLA₂-COX-2 induction factors regulating, 565–66
- Spinal prostaglandins (PG), 563–65
- Spinal prostanoid-mediated effects on hyperalgesic processing, 564–65
behavior, 564–65
cellular actions, 564–65
- Spinal prostanoids release of, 564
- Spironolactone, 4
- SPLA₂, 557
- Squash virus-resistant, 100
- SR12813, 6–8
- St. John's wort, 15
- Stability of S-nitrosothiols, 587–89
- Standard Product Nomenclature, 122
- Staphylococci*, 381
- Staphylococcus aureus*, 393 methicillin-resistant, 381
- STAT-6 inhibition of, 86
- Steroid and zenobiotic receptor (SXR), 5
- Steroids, 2–3, 567
- Sterol 27-hydroxylase (CYP27), 11
- Stimulus-biased assays, 361–62
- Stimulus-response mechanisms of receptor systems, 370
- STKE
See Signal transduction knowledge environment
- Streptococci*, 381
- Streptococcus bovis*, 394–95
- S. faecalis*, 528
- S. galolyticus*, 394
- S. pneumoniae*, 394–95
- Streptomyces orientalis*, 381
- S. toyocaensis*, 386, 395
- Structural bases of cdk2, ATP, and cyclins, 327–28
of COX inhibition, 62–63
of pharmacological specificity, 452–54
- Structural topology of NHE1, 528–30
- Structures, 471–76
of chemokines with known three-dimensional structures and their receptors, 473–74
of COX inhibitors, 65
of difluorophosphonate-containing PTP1B inhibitors, 224
of nonphosphorus small-molecule PTP1B inhibitors, 225
of NSAIDs and related compounds, 64
primary, 471–72
quaternary, 474–76
secondary, 472
of small-molecule Cdc25 inhibitors, 227
of tea polyphenols, 26–28
tertiary, 473–74
of vancomycin and teicoplanin, 382
- Substituted-cysteine accessibility method (SCAM), 449–50

- Susceptibility to carcinogenesis possible inverse relationship to capacity of maintaining normal patterns of DNA methylation, 509
- SXR**
See Steroid and xenobiotic receptor
- "Synaptic plasticity," 136, 142
- Systematized Nomenclature of Medicine**, 120
- T**
- T helper 2 (Th2) cytokines inhibition of, 82–87
- Tacrolimus, 81, 92
- TARC**
See Thymus- and activation-dependent chemokine
- Targeted disruption of the PXR gene in mice, 10–11
- Targeted serum screening, 106–7
- Taurochenodeoxycholic acid, 3
- TBS**
See Theta-burst stimulation
- TCDD**
See 2,3,7,8-Tetrachlorodibenzo-p-dioxin
- TEA**
See Tetraethylammonium
- Tea catechins absorption and biotransformation of, 29–30
- Tea chemistry, 26–28 structures of tea polyphenols, 26–28
- Teicoplanin, 382, 398
- Teratogenic exposure and the susceptible genotype, 189–92
- Teratogenic potential, 182–83, 195–96
- Tertiary structure, 473–74
- 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD), 188
- 12-O-Tetradecanoylphorbol-13-acetate (TPA), 32, 62
- Tetraethylammonium (TEA), 271
- Tetrapentylammonium (TPA), 271
- TF**
See Theaflavins
- TFdiG**
See Theaflavin digallate
- TGF**
See Transforming growth factor
- Th2 selective inhibitors, 81, 87
- Thalidomide, 193–94
- Theaflavin digallate (TFdiG), 43
- Theaflavins (TF), 28, 39, 45
- Thearubigins, 27–28
- Theta-burst stimulation (TBS), 140
- Three-dimensional structural data, 119
- Thymus- and activation-dependent chemokine (TARC), 92
- TM**
See Transmembrane segment
- TPA**
See 12-O-Tetradecanoylphorbol-13-acetate; Tetrapentylammonium
- Transcription factor cAMP response element
- binding protein (CREB), 148–49
- Transduction**
See Signal transduction
- TRANSFAC**, 119
- Transforming growth factor (TGF), 186, 192, 198, 299
- Transgenic models, 11
- Transmembrane domain residues implicated in ligand binding, 440–45
- Transmembrane segments (TMs), 437–67
- Triacetyloleandomycin, 4
- Tumorigenesis**
inhibition in animal models, 32–41
inhibition in gastrointestinal tract, 38–39
inhibition of mammary gland, 40
inhibition of multi-organ, 41
- TUNEL method**, 45
- Tyrosine phosphorylation, 209–10
- U**
- Ubiquitin-conjugating (UBC) domains, 262
- UC Santa Cruz browser, 118
- UDP-glucuronyltransferase, 45
- Unified Medical Language System (UMLS) project, 121–22
- United Nations Food & Agriculture Organization**, 100
- V**
- Vaccinia* viruses (VV), 483
- Valproic acid, 197–99
- Van* gene clusters that confer resistance to

- glycopeptide antibiotics, 387
- Van gene expression regulation of, 396–97
- VanA, 386–90
- VanB, 391
- VanC, 391–92
- Vancomycin, 381–82, 395
- Vancomycin resistance in staphylococci, mechanism of, 394 strategies for overcoming, 397–400
- Vancomycin resistant enterococci (VRE), 385–86
- VanD, 392
- VanE, 392–93
- VanG, 392–93
- vanH active site orientation of, 388
- vanR-vanS* two-component regulatory system mechanism of action, 397
- Varied roles alterations in DNA methylation play in carcinogenesis, 513–14
- Vascular endothelial growth factor (VEGF), 45–46
- VDAC
- See Voltage dependent anion channel
- Veratrun californicum*, 189
- Verbal Declarative Memory Test, 168
- Viral chemokine homologues, 482–83
- Virus-resistant squash and papaya, 100
- Vitamins fat-soluble, 2, 12
- Voltage dependent anion channel (VDAC), 266
- Volume regulatory responses, 269–70
- VRE
- See Vancomycin resistant enterococci
- VV
- See *Vaccinia* viruses
- W**
- WASP activation, 309, 311
- WAVE activation, 309, 311
- WHO
- See World Health Organization
- Wild-type human PXR (Alb-PXR), 11
- Wisconsin Card Sorting Test, 168, 171
- WNT pathway
- cadherins regulating signaling in, 301
- World Health Organization
- (WHO), 100, 102–4, 106–9
- Adverse Drug Reaction Terminology, 122
- X**
- X-ray crystal structure of the PXR LBD, 13–15
- Xenobiotic response elements in *CYP3A* genes, 4–5
- Xenobiotic-responsive enhancer module (XREM), 10
- Xenobiotics
- binding and activating PXR, 6–7
- metabolism of, 2–3
- Xenopus laevis*, 366, 528
- Xenopus orphan nuclear receptor-1 (xONR1), 7
- XML
- See eXtensible Markup Language
- XREM
- See Xenobiotic-responsive enhancer module
- Y**
- Yellow fluorescent protein (YFP), 412
- Yotiao
- and NMDA receptor function, 247–48



CUMULATIVE INDEXES

CONTRIBUTING AUTHORS, VOLUMES 38-42

- Acosta D Jr, 38:63-96
Adams JP, 42:135-63
Allen JW, 39:151-73
Altman RB, 42:113-33
Amara SG, 39:431-56
Ambudkar SV, 39:361-97
Anders MW, 38:501-37
Anderson SP, 40:491-518
Angers S, 42:409-35
Aschner M, 39:151-73
Atkinson AJ Jr, 41:347-66
- Bagdassarian CK,
41:661-90
Baker RC, 39:127-50
Bakhle YS, 38:97-120
Balboa MA, 39:175-89
Balsinde J, 39:175-89
Barber DL, 42:527-52
Barnes PJ, 42:81-98
Benovic JL, 38:289-319
Bertaccini E, 41:23-51
Blackburn TP, 40:319-34
Blau HM, 40:295-317
Bode-Böger SM,
41:79-99
Böger RH, 41:79-99
Borges K, 39:221-41
Borjigin J, 39:53-65
Bortner CD, 42:259-81
Botting RM, 38:97-120
Bouvier M, 42:409-35
Bradfield CA, 40:519-61
Branchek TA, 40:319-34
Brett CM, 38:431-60
Breyer MD, 41:661-90
Breyer RM, 41:661-90
Broder S, 40:97-132
Brown JH, 40:459-89
- Brunton LL, 41:751-73
Burgen ASV, 40:1-16
Burke MD, 41:297-316
- Eudy JD, 42:181-208
Evans WE, 41:101-21
- Farquhar MG, 40:235-71
Felder CC, 38:179-200
Fernandez EJ, 42:469-99
Finnell RH, 42:181-208
Fischer T, 40:235-71
Fisher JW, 38:1-20
Flexner C, 40:651-76
Fu H, 40:619-49
Fukushima N, 41:507-34
- Gelineau-van Waes J,
42:181-208
Giachelli CM, 41:723-49
Giacomini KM, 38:431-60
Gillette JR, 40:19-41
Glass M, 38:179-200
Golding BT, 42:325-48
Goodman JI, 42:501-25
Goodwin B, 42:1-23
Gottesman MM, 39:361-97
Greenlee WF, 41:297-316
Griffin RJ, 42:325-48
Gu Y-Z, 40:519-61
Guengerich FP, 39:1-17
Guyton KZ, 41:421-42
- Hammond HK, 39:343-60
Hanoune J, 41:145-74
Hardcastle IR, 42:325-48
Harris RA, 41:23-51
Heinrich M, 38:539-65
Hickson ID, 41:367-401
Hobbs AJ, 39:191-220
Hoffman AR, 38:45-61
Hogenesch JB, 40:519-61
Hogg N, 42:585-600

- Holford NHG, 40:209-34;
41:625-59
- Holm-Waters S, 41:237-60
- Hook SS, 41:471-505
- Hosokawa M, 38:257-88
- Houghton RA, 40:273-82
- Hrycyna CA, 39:361-97
- Insel PA, 39:175-89, 343-60;
41:593-624
- Ishii I, 41:507-34
- Ito K, 38:461-99
- Iwatsubo T, 38:461-99
- Javitch JA, 42:437-67
- Johnson DG, 39:295-312
- Juliano RL, 42:283-323
- Kanamitsu S, 38:461-99
- Kedzierski RM, 41:851-76
- Kenakin T, 42:349-79
- Kensler TW, 41:421-42
- Kim RB, 41:815-50
- Kimelberg HK, 39:151-73
- Kimko HC, 40:209-34
- Kitteringham NR, 41:443-70
- Klaassen CD, 39:267-94
- Klein PS, 41:789-813
- Klein TE, 42:113-33
- Kliwera SA, 42:1-23
- Kobilka BK, 38:351-73
- Kramer RE, 39:127-50
- Krupnick JG, 38:289-319
- Lau SS, 38:229-55
- Law P-Y, 40:389-430
- Lebedeva I, 41:403-19
- Lee HC, 41:317-45
- Lee SJ, 41:569-91
- Lefer DJ, 40:283-94
- Le Novère N, 40:431-58
- Lesko LJ, 41:347-66
- Li T-K, 41:53-77
- Li X, 39:53-65
- Lin JH, 41:535-67
- Linden J, 41:775-87
- Lipton SA, 38:159-77
- Liu J, 39:267-94
- Liu LF, 41:53-77
- Loh HH, 40:389-430
- Lolis E, 42:469-99
- LoPachin RM, 39:151-73
- Lu AYH, 41:535-67
- Maliakal P, 42:25-54
- Mao GE, 39:399-430
- Marcus R, 38:45-61
- Marnett LJ, 42:55-80
- Martin E, 41:203-36
- Masters SC, 40:619-49
- McEwen BS, 41:569-91
- McLeod HL, 41:101-21
- Means AR, 41:471-505
- Melchert RB, 38:63-96
- Melvin WT, 41:297-316
- Meng X, 42:25-54
- Metcalf B, 40:193-208
- Michel JJ, 42:235-57
- Miller RJ, 38:201-27
- Moncada S, 39:191-220
- Monks TJ, 38:229-55
- Monteleone JPR, 40:209-34
- Montfort WR, 41:261-95
- Murad F, 41:203-36
- Murray GI, 41:297-316
- Myers SA, 41:661-90
- Myers SJ, 39:221-41
- Nagata K, 40:159-76
- Nakajima Y, 38:461-99
- Negishi M, 41:123-43
- Nemeroff CB, 41:877-906
- Neu J, 42:381-408
- Nilsson M, 41:237-60
- Norbury CJ, 41:367-401
- North RA, 40:563-80
- Ohlstein EH, 40:177-91
- O'Neill PM, 41:443-70
- Ortiz de Montellano BR,
38:539-65
- Otterness DM, 39:19-52
- Owens MJ, 41:877-906
- Ozawa CR, 40:295-317
- Park BK, 41:443-70
- Pastan I, 39:361-97
- Peck CC, 40:209-34
- Phiel CJ, 41:789-813
- Plaa GL, 40:43-65
- Pootoolal J, 42:381-408
- Posner GH, 41:421-42
- Post SR, 39:343-60
- Powis G, 41:261-95
- Puga A, 39:67-101
- Putney LK, 42:527-52
- Ramachandra M, 39:361-97
- Ramos KS, 39:243-65
- Rana BK, 41:593-624
- Redinbo MR, 42:1-23
- Rittling SR, 41:723-49
- Robles M, 38:539-65
- Rodan GA, 38:375-88
- Rodriguez E, 38:539-65
- Rodriguez RJ, 38:63-96
- Rohrer DK, 38:351-73
- Rosenquist TH, 42:181-208
- Ruffolo RR Jr, 40:177-91
- Safe SH, 38:121-58
- Sagi SA, 40:459-89
- Sah VP, 40:459-89
- Salahpour A, 42:409-35
- Satoh T, 38:257-88
- Scott JD, 42:235-57
- Seal RP, 39:431-56
- Seasholtz TM, 40:459-89
- Sheiner L, 40:67-96
- Shertzer HG, 39:67-101
- Shi L, 42:437-67
- Shiina T, 41:593-624
- Shoham M, 41:175-202
- Sibley DR, 39:313-41
- Snyder SH, 39:53-65
- Springer ML, 40:295-317
- Starkov AA, 40:353-88
- Stauber A, 40:491-518
- Steimer J-L, 40:67-96
- Stein CA, 41:403-19
- Stein CM, 41:815-50
- Steinberg SF, 41:751-73

- Stout SC, 41:877-906
Strassburg CP, 40:581-618
Streit WJ, 39:151-73
Subramanian RR, 40:619-49
Sueyoshi T, 41:123-43
Sugiyama Y, 38:461-99
Surprenant A, 40:563-80
Svensson CI, 42:553-83
Sweatt JD, 42:135-63
Szumlanski CL, 39:19-52
- Taylor SL, 42:99-112
Tedroff J, 41:237-60
Thibonnier A, 41:175-202
Thibonnier M, 41:175-202
Thummel KE, 38:389-430
Trudell JR, 41:23-51
Tsai G, 42:165-79
- Tukey RH, 40:581-618
Turko IV, 41:203-36
Ulrich RG, 40:335-52
Vane JR, 38:97-120
Venter JC, 40:97-132
- Walker CL, 39:295-312
Wallace KB, 40:353-88
Waring JF, 40:335-52
Waters N, 41:237-60
Watson RE, 42:501-25
Weiner JA, 41:507-34
Weinshilboum RM,
39:19-52
West JE, 38:539-65
White RE, 40:133-57
- Whitlock JP Jr, 39:103-25
Wilkinson GR, 38:389-430
Wong YH, 40:389-430
Wood AJ, 41:815-50
Wright GD, 42:381-408
- Xie H-G, 41:815-50
- Yaksh TL, 42:553-83
Yamakura T, 41:23-51
Yamazoe Y, 40:159-76
Yanagisawa M, 41:851-76
Yang CS, 42:25-54
Yoshimura N, 41:691-721
- Zhang L, 38:431-60
Zhang Z-Y, 42:209-34
Zheng B, 40:235-71

CHAPTER TITLES, VOLUMES 38-42

Prefatory

PHARMACOLOGY

A Quest for Erythropoietin Over Nine Decades	JW Fisher	38:1-20
Targets of Drug Action	A Burgen	40:1-16
High-Throughput Screening in Drug Metabolism and Pharmacokinetic Support of Drug Discovery	RE White	40:133-57

TOXICOLOGY

Laboratory of Chemical Pharmacology, National Heart, Lung, and Blood Institute, NIH: A Short History	JR Gillette	40:19-41
Chlorinated Methanes and Liver Injury: Highlights of the Past 50 Years	GL Plaa	40:43-65
Central Role of Peroxisome Proliferator-Activated Receptors in the Actions of Peroxisome Proliferators	JC Corton, SP Anderson, A Stauber	40:491-518
Toxicology Comes of Age	J Doull	41:1-21

General Topics in Pharmacology and Toxicology

RECEPTORS

Cannabinoid Receptors and Their Endogenous Agonists	CC Felder, M Glass	38:179-200
Presynaptic Receptors	RJ Miller	38:201-27
From GABA Receptor Diversity Emerges A Unified Vision of GABAergic Inhibition	E Costa	38:321-50
Insights from In Vivo Modification of Adrenergic Receptor Gene Expression	DK Rohrer, BK Kobilka	38:351-73
Genetic Regulation of Glutamate Receptor Ion Channels	SJ Myers, R Dingledine, K Borges	39:221-41
New Insights into Dopaminergic Receptor Function Using Antisense and Genetically Altered Animals	DR Sibley	39:313-41
5-HT ₆ Receptors as Emerging Targets for Drug Discovery	TA Branchek, TP Blackburn	40:319-34

Nicotinic Receptors at the Amino Acid Level	P-J Corringer, N Le Novère, J-P Changeux	40:431-58
Pharmacology of Cloned P2X Receptors	RA North, A Surprenant	40:563-80
Lysophospholipid Receptors	N Fukushima, I Ishii, JJ Contos, JA Weiner, J Chun	41:507-34
Genetic Variations and Polymorphisms of G Protein-Coupled Receptors: Functional and Therapeutic Implications	BK Rana, T Shiina, PA Insel	41:593-624
Prostanoid Receptors: Subtypes and Signaling	RM Breyer, CK Bagdassarian, SA Myers, MD Breyer	41:661-90
Role of Osteopontin in Cellular Signaling and Toxicant Injury	DT Denhardt, CM Giachelli, SR Rittling	41:723-49
Molecular Approach to Adenosine Receptors: Receptor-Mediated Mechanisms of Tissue Protection	J Linden	41:775-87
Glutamatergic Mechanisms in Schizophrenia Drug Efficacy at G Protein-Coupled Receptors	G Tsai, JT Coyle	42:165-79
Dimerization: An Emerging Concept for G Protein-Coupled Receptor Ontogeny and Function	T Kenakin	42:349-79
The Binding Site of Aminergic G Protein-Coupled Receptors: The Transmembrane Segments and Second Extracellular Loop	S Angers, A Salahpour, M Bouvier	42:409-35
RENAL SYSTEM	L Shi, JA Javitch	42:437-67
Pharmacology of the Lower Urinary Tract	WC de Groat, N Yoshimura	41:691-721
SIGNAL TRANSDUCTION		
Physiological Functions of Cyclic ADP-Ribose and NAADP as Calcium Messengers	HC Lee	41:317-45
Cellular Mechanisms for the Repression of Apoptosis	CD Bortner, JA Cidlowski	42:259-81
SYNAPTIC FUNCTIONS		
Signal Transduction in Environmental Neurotoxicity	LG Costa	38:21-43

Inhibition of Nitric Oxide Synthase as a Potential Therapeutic Target	AJ Hobbs, A Higgs, S Moncada	39:191-220
Redox Regulation of <i>c-Ha-ras</i> and Osteopontin Signaling in Vascular Smooth Muscle Cells: Implications in Chemical Atherogenesis	KS Ramos	39:243-65
Cyclins and Cell Cycle Checkpoints	DG Johnson, CL Walker	39:295-312
The Regulator of G Protein Signaling Family	L De Vries, B Zheng, T Fischer, E Elenko, MG Farquhar	40:235-71
Pharmacology of Selectin Inhibitors in Ischemia/Reperfusion States	DJ Lefer	40:283-94
The Role of Rho in G Protein-Coupled Receptor Signal Transduction	VP Sah, TM Seasholtz, SA Sagi, JH Brown	40:459-89
14-3-3 Proteins: Structure, Function, and Regulations	HFu, RR Subramanian, SC Masters	40:619-49
Molecular Psychology: Roles for the ERK MAP Kinase Cascade in Memory	JP Adams, JD Sweatt	42:135-63
TRANSPORTERS		
Compartmentation of G Protein-Coupled Signaling Pathways in Cardiac Myocytes	SF Steinberg, LL Brunton LL	41:751-73
AKAP-Mediated Signal Transduction	JJC Michel, JD Scott	42:235-57
The Changing Face of the Na^+/H^+ Exchanger, NHE1: Structure, Regulation, and Cellular Actions	LK Putney, SP Denker, DL Barber	42:527-52
ENZYMES		
The Mammalian Carboxylesterases: From Molecules to Functions	T Satoh, M Hosokawa	38:257-88
The Role of Receptor Kinases and Arrestins in G Protein-Coupled Receptor Regulation	JG Krupnick, JL Benovic	38:289-319
Methylation Pharmacogenetics: Catechol O-Methyltransferase, Thiopurine Methyltransferase, and Histamine N-Methyltransferase	RM Weinshilboum, DM Otterness, CL Szumlanski	39:19-52
Regulation and Inhibition of Phospholipase A ₂	J Balsinde, MA Balboa, PA Insel, EA Dennis	39:175-89

Human UDP-Glucuronosyltransferases: Metabolism, Expression, and Disease	RH Tukey, CP Strassburg	40:581-618
Tumor Cell Death Induced by Topoisomerase-Targeting Drugs	T-K Li, LF Liu	41:53-77
Phenobarbital Response Elements of Cytochrome P450 Genes and Nuclear Receptors	T Sueyoshi, M Negishi	41:123-43
Regulation and Role of Adenylyl Cyclase Isoforms	J Hanoune, N Defer	41:145-74
Regulation of CYP3A Gene Transcription by the Pregnan X Receptor	B Goodwin, MR Redinbo, SA Kliewer	42:1-23
Protein Allergenicity Assessment of Foods Produced Through Agricultural Biotechnology	SL Taylor	42:99-112
The Biochemistry and Physiology of S-Nitrosothiols	N Hogg	42:585-600

CHEMICAL AGENTS

The Pharmacology and Toxicology of Polyphenolic-Glutathione Conjugates	TJ Monks, SS Lau	38:229-55
Ethnopharmacology of Mexican Asteraceae (Compositae)	M Heinrich, M Robles, JE West, BR Ortiz de Montellano, E Rodriguez	38:539-65
The Pineal Gland and Melatonin: Molecular and Pharmacologic Regulation	J Borjigin, X Li, SH Snyder	39:53-65
Regulation of Gene Expression by Reactive Oxygen	TP Dalton, HG Shertzer, A Puga	39:67-101
Cytotoxicity of Short-Chain Alcohols	RC Baker, RE Kramer	39:127-50
Metallothionein: An Intracellular Protein to Protect Against Cadmium Toxicity	CD Klaassen, J Liu, S Choudhuri	39:267-94
Teratology of Retinoids	MD Collins, GE Mao	39:399-430
The Clinical Pharmacology of L-Arginine	RH Böger, SM Bode-Böger	41:79-99
The Basic and Clinical Pharmacology of Nonpeptide Vasopressin Receptor Antagonists	M Thibonnier, P Coles, A Thibonnier, M Shoham	41:175-202

Novel Effects of Nitric Oxide	KL Davis, E Martin, IV Turk, F Murad	41:203-36
Inhibition of Carcinogenesis by Tea	CS Yang, P Maliakal, X Meng	42:25-54
PEPTIDES AND PROTEINS		
Protein Allergenicity Assessment of Foods Produced Through Agricultural Biotechnology	SL Taylor	42:99-112
BIOTRANSFORMATION		
In Vitro and In Vivo Drug Interactions Involving Human CYP3A	KE Thummel, GR Wilkinson	38:389-430
Glutathione-Dependent Bioactivation of Haloalkenes	MW Anders, W Dekant	38:501-37
Cytochrome P-450 3A4: Regulation and Role in Drug Metabolism	FP Guengerich	39:1-17
Induction of Cytochrome P4501A1	JP Whitlock Jr.	39:103-25
Metabolism of Fluorine-Containing Drugs	BK Park, NR Kitteringham, PM O'Neill	41:443-70
Interindividual Variability in Inhibition and Induction of Cytochrome P450 Enzymes	JH Lin, AYH Lu	41:535-67
Regulation of CYP3A Gene Transcription by the Pregnen X Receptor	B Goodwin, MR Redinbo, SA Kliewer	42:1-23
NUCLEIC ACIDS		
Cellular Responses to DNA Damage	CJ Norbury, ID Hickson	41:367-401
Ca ²⁺ /CaM-Dependent Kinases: From Activation to Function	SS Hook, AR Means	41:471-505
PHARMACOKINETICS/TOXICOKINETICS		
Role of Organic Cation Transporters in Drug Absorption and Elimination	L Zhang, CM Brett, KM Giacomini	38:431-60
Biochemical, Cellular, and Pharmacological Aspects of the Multidrug Transporter	SV Ambudkar, S Dey, CA Hrycyna, M Ramachandra, I Pastan, MM Gottesman	39:361-97
Mitochondrial Targets of Drug Toxicity	KB Wallace, AA Starkov	40:353-88

CANCER AND CARCINOGENESIS

Interactions Between Hormones and Chemicals in Breast Cancer	SH Safe	38:121-58
Properties and Biological Activities of Thioredoxins	G Powis, WR Montfort	41:261-95
Cancer Chemoprevention Using Natural Vitamin D and Synthetic Analogs	KZ Guyton, TW Kensler, GH Posner	41:421-42
Inhibition of Carcinogenesis by Tea	CS Yang, P Maliakal, X Meng	42:25-54
COX-2: A Target for Colon Cancer Prevention	LJ Marnett, RN DuBois	42:55-80
Glycopeptide Antibiotic Resistance	J Pootoolal, J Neu, GD Wright	42:381-408
Altered DNA Methylation: A Secondary Mechanism Involved in Carcinogenesis	JI Goodman, RE Watson	42:501-25

CLINICAL THERAPEUTICS

Dual Protease Inhibitor Therapy in HIV-Infected Patients: Pharmacologic Rationale and Clinical Benefits	C Flexner	40:651-76
Pharmacogenomics: Unlocking the Human Genome for Better Drug Therapy	HL McLeod, WE Evans	41:101-21
Antisense Oligonucleotides: Promise and Reality	I Lebedeva, CA Stein	41:403-19
Glycopeptide Antibiotic Resistance	J Pootoolal, J Neu, GD Wright	42:381-408

DRUG DEVELOPMENT SCIENCE

Parallel Array and Mixture-Based Synthetic Combinatorial Chemistry: Tools for the Next Millennium	RA Houghten	40:273-82
A Novel Means of Drug Delivery: Myoblast-Mediated Gene Therapy and Regulatable Retroviral Vectors	CR Ozawa, ML Springer, HM Blau	40:295-317
Use of Biomarkers and Surrogate Endpoints in Drug Development and Regulatory Decision Making: Criteria, Validation, Strategies	L Lesko, AJ Atkinson Jr.	41:347-66
Molecular Basis of Environmentally Induced Birth Defects	RH Finnell, J Gelineau-van Waes, JD Eudy, TH Rosenquist	42:181-208

Protein Tyrosine Phosphatases: Structure and Function, Substrate Specificity, and Inhibitor Development	Z-Y Zhang	42:209-34
Designing Inhibitors of Cyclin-Dependent Kinases	IR Hardcastle, BT Golding, RJ Griffin	42:325-48
Systems		
IMMUNE SYSTEM/INFLAMMATION		
Cyclooxygenases 1 and 2	JR Vane, YS Bakhle, RM Botting	38:97-120
Signal Transduction by Cell Adhesion Receptors and the Cytoskeleton: Functions of Integrins, Cadherins, Selectins, and Immunoglobulin-Superfamily Members	RL Juliano	42:283-323
Structure, Function, and Inhibition of Chemokines	EJ Fernandez, E Lolis	42:469-99
CENTRAL NERVOUS SYSTEM		
Glia Cells in Neurotoxicity Development	M Aschner, JW Allen, HK Kimelberg, RM LoPachin, WJ Streit	39:151-73
Excitatory Amino Acid Transporters: A Family in Flux	RP Seal, SG Amara	39:431-56
Molecular Mechanisms and Regulation of Opiod Receptor Signaling	P-Y Law, YH Wong, HH Loh	40:389-430
Anesthetics and Ion Channels: Molecular Models and Sites of Action	T Yamakura, E Bertaccini, JR Trudell, RA Harris	41:23-51
Interactions Between Monoamines, Glutamate, and GABA in Schizophrenia: New Evidence	A Carlsson, N Waters, S Holm-Waters, J Tedroff, M Nilsson, ML Carlsson	41:237-60
Drug Treatment Effects on Disease Progression	P Chan, N Holford	41:625-59
Molecular Targets of Lithium Action	CJ Phiel, PS Klein	41:789-813
Neurokinin1 Receptor Antagonists as Potential Antidepressants	SC Stout, MJ Owens, CB Nemeroff	41:877-906

Glutamatergic Mechanisms in Schizophrenia The Spinal Phospholipase-Cyclooxygenase-Prostanoid Cascade in Nociceptive Processing	G Tsai, JT Coyle CI Svensson, TL Yaksh	42:165-79 42:553-83
AUTONOMIC NERVOUS SYSTEM		
β -Adrenergic Receptors and Receptor Signaling in Heart Failure	SR Post, HK Hammond, PA Insel	39:343-60
Genetic Variations and Polymorphisms of G Protein-Coupled Receptors: Functional and Therapeutic Implications	BK Rana, T Shiina, PA Insel	41:593-624
CARDIOVASCULAR SYSTEM		
Endothelin System: The Double-Edged Sword in Health and Disease	RM Kedzierski, M Yanagisawa	41:851-76
ENDOCRINE SYSTEM		
Growth Hormone As Therapy for Older Men and Women	R Marcus, AR Hoffman	38:45-61
Mechanism of Action of Biophosphates	GA Rodan	38:375-88
Neurotrophic and Neuroprotective Actions of Estrogens and Their Therapeutic Implications	SJ Lee, BS McEwen	41:569-91
PULMONARY SYSTEM		
Cytokine Modulators as Novel Therapies for Asthma	PJ Barnes	42:81-98
MICROBIAL SYSTEMS		
Neuronal Injury Associated with HIV-1: Approaches to Treatment	SA Lipton	38:159-77
Miscellaneous		
TECHNIQUES		
Predictive Value of In Vitro Model Systems in Toxicology	JC Davila, RJ Rodriguez, RB Melchert, D Acosta Jr.	38:63-96

Quantitative Prediction of In Vivo Drug Clearance and Drug Interactions from In Vitro Data on Metabolism, and Together with Binding and Transport

K Ito, T Iwatsubo,
S Kanamitsu,
Y Nakajima,
Y Sugiyama

38:461-99

The Impact of Genomics-Based Technologies on Drug Safety Evaluation Challenges for Biomedical Informatics and Pharmacogenomics

JF Waring, RG Ulrich
RB Altman, TE Klein

40:335-52

42:113-33

ENVIRONMENTAL TOXICITY

The PAS Superfamily: Sensors of Environmental and Developmental Signals

Y-Z Gu, JB Hogenesch,
CA Bradfield

40:519-61

Pharmacology and Toxicology in the New Millennium

Pharmacokinetic/Pharmacodynamic Modeling in Drug Development
Sequencing the Entire Genomes of Free-Living Organisms: The Foundation of Pharmacology in the New Millennium
High-Throughput Screening in Drug Metabolism and Pharmacokinetic Support of Drug Discovery
Pharmacogenetics of Sulfotransferase
Drug Discovery in the Next Millennium

LB Sheiner, J-L Steimer

40:67-96

S Broder, JC Venter

40:97-132

The Impact of Genomics on Drug Discovery
Simulation of Clinical Trials

RE White
K Nagata, Y Yamazoe
EH Ohlstein,
RR Ruffolo Jr.,
JD Elliott
C Debouck, B Metcalf
NHG Holford, HC Kimko,
JPR Monteleone,
CC Peck

40:133-57

40:159-76

40:177-91

40:193-208

40:209-34

